VOL. XXX. CLEVELAND, O., DECEMBER 22, 1904. No. 25.

MR. LIVINGSTONE'S ADDRESS AT TONAWANDA

William Livingstone of Detroit, president of the Lake Carriers' Association, delivered a most impressive address at the annual banquet of the North Tonawanda Board of Trade last week. His topic was "Commerce" and he handled it masterfully. It is regretted that the whole of this address cannot be given in this issue. It was stated directly after it was delivered that his plea for a merchant marine to carry the American flag should be placed in the hands of every patriotic American. He said that when the shipping of this great United States of America dwindles so low that only a single ship in a whole year carrying the American flag passes through the Suez canal the red blood in every American should be aroused to apply a remedy for the present conditions.

"The foreign trade of the United States has been growing by leaps and bounds until it has now reached the enormous total of two and one-half billions of dollars annually," said the speaker, "and yet this great export trade of the United States is enriching the foreign ship owner."

The part of Mr. Livingstone's speech of greatest interest to his hearers was his remarks on the proposed ship canal around the rapids at the head of Niagara river. Mr. Livingstone in his capacity of president of the Lake Carriers' Association is on the inside so to speak as to the efforts put forth during the last few years to secure a federal appropriation to build the ship canal. In substance Mr. Livingstone's reference to the canal was as follows:

"We are asking for three or four millions to make a new harbor for Buffalo and to perfect a gateway to tidewater. This project is no local matter. The benefits will accrue to the whole country. Greater facilities must be afforded for the handling of commerce at this end of the great lakes or trade will be diverted from this vicinity which will mean that New York state can no longer maintain its supremacy as the empire state. I have no doubt that congress will grant the appropriation that has been asked for. The canal is an absolute necessity. It will make the whole Niagara between the Tonawandas and Buffalo one great harbor at whose docks the deepest draught vessels may land.

"There are other improvements of course which must be made in connection with this ship canal. A deeper channel must be dredged at the Lime Kiln crossing and changes must be made at the Sault but these will come easily if the ship canal is authorized.

"I want to urge on this Board of Trade that I have no doubt of your success in handling big matters of concern to your city. Objections are raised and delays must be expected but earnest, energetic efforts win out in the end. I cannot tell you any advantages the ship canal would bring to the Tonawandas. It would be like carrying coals to New Castle if I presumed to attempt such a thing. We see before us here tonight young active business men. On you depends the future of this city and of the country. I am an optimist on the future of the United States. The commerce of the great lakes alone is in its infancy. Ten years ago it was thought that the high tide had been reached when a freighter of 3,000 tons capacity was built. The 5,000-ton era quickly followed but even then a man who predicted the 10,000-ton freighter would have been considered a fit subject for an insane asylum. But we not only have the 10,000-ton carrier but we have gone as high as 10,500 tons. The A. B. Wolvin, the largest vessel on the great lakes, has the latter capacity and it won't be long before she is a back number."

Toastmaster John W. Robinson introduced J. J. H. Brown as the next speaker. Capt. Brown is president of the Buffalo Chamber of Commerce. He said Buffalo has materially assisted in securing some big undertakings such as the 1,000-ton barge canal and the new breakwater at Buffalo.

"And Buffalo won't let up until the ship canal is dug," said Captain Brown. "The charge has been made that New York state will benefit so much from the ship canal that it should be willing to pay a large part of the cost. New York has already given $101,000,000 toward this ship canal. This great work which means so much for the whole Niagara river from Stony Point to Lake Ontario needs the help of you, young men, in North Tonawanda."

A. W. Gray of Niagara Falls, followed Capt. Brown. He said Niagara Falls appreciates the work of the North Tonawandas Board of Trade and advocated more neighborly relations between the two cities. He said the interests of the cataract city and the Tonawandas are identical.

"We don't see enough of each other," said Mr. Gray. "Both cities are rapidly growing toward La Salle and we will soon be one community in fact, although under separate governments. We can help you and you can help us."

Hon. George F. Thompson of Middleport; S. B. Dickinson, president of the Lockport Business Men's Association, and Mr. Theodore S. Fassett of Buffalo also spoke briefly.

The out-of-town guests at the speakers' table were: Capt. William Livingstone of Detroit, Capt. J. J. H. Brown, president of Buffalo Chamber of Commerce; George P. Sawyer, T. S. Fassett and Van Horn Ely of Buffalo; Hon. George Thompson of Middleport; C. E. Dickenson and W. T. Ransom of Lockport, A. W. Gray, G. W. Knox of Niagara Falls. Other out-of-town guests included J. H. Rothery, J. E. Williams of Niagara Falls; Willard Ransom and J. E. Hall of Lockport; John J. Boland, C. H. Seymour, J. S. Wood, J. S. Sedgwick and J. C. Quintus of Buffalo.

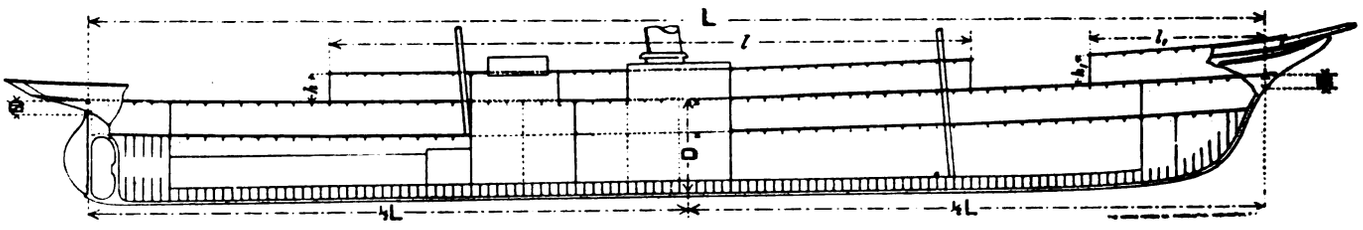
LLOYD'S RULES FOR YACHT CONSTRUCTION

At the recent meeting of the Society of Naval Architects and Marine Engineers held in New York city Mr. George Stanbury, principal surveyor for Lloyd in the United States, read a most valuable paper upon the subject "On the Rules of Lloyd's Register for Building Yachts to Class." The discussion which followed highly commended the reasonableness of Lloyds in allowing latitude to designers. Mr. Stanbury's paper was as follows:

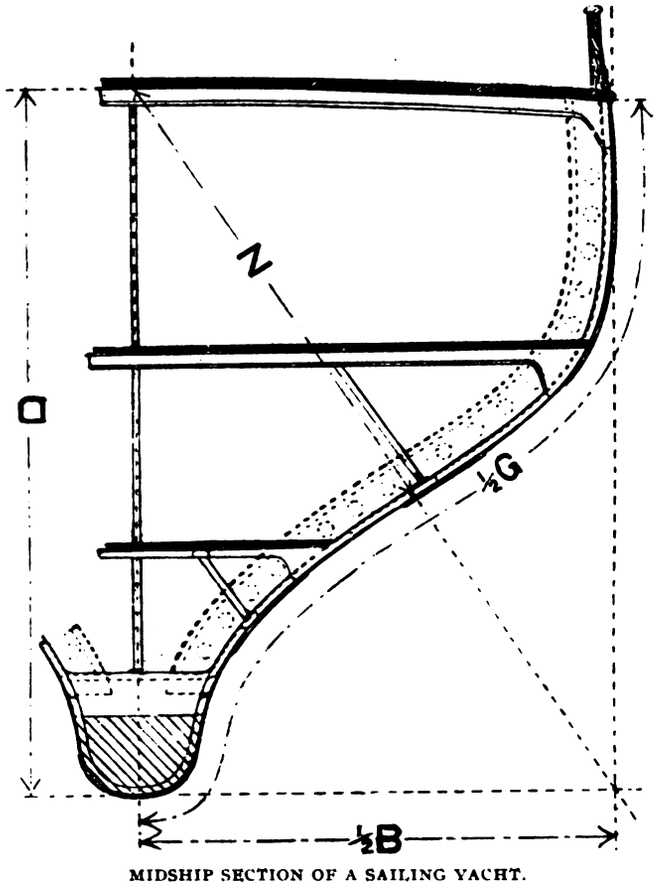
"In compliance with the request of the executive committee of the Society of Naval Architects and Marine Engineers, I have the honor to submit the following remarks for the consideration of the members of this society on the latest rules of Lloyd's Register of Shipping for the building and classification of yachts. The form and construction of yachts, more especially those used for racing purposes, have undergone many changes since the first rules for the building and classification of yachts were issued by Lloyd's Register 25 years ago. Last year it was considered that the time had come when the rules for these pleasure vessels should be modified to make them more suitable for application to the type of yachts now generally built. With this object in view the opinions of yacht builders and designers in the United States and in the United Kingdom were invited by Lloyd's Register, and their suggestions were adopted as far as practicable in compiling the rules now in operation.

"After the most careful consideration of Lloyd's Register

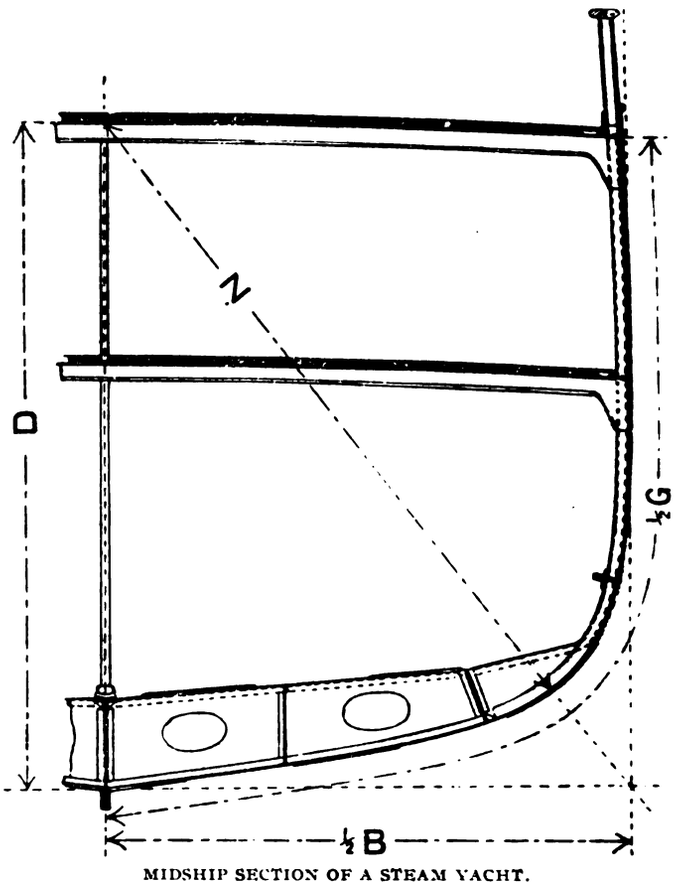
Sketches Illustrating the Method of Determining the Dimensions for Obtaining Scantling Numbers for Steel Yachts.



PROFILE OF A STEAM YACHT.



MIDSHIP SECTION OF A SAILING YACHT.



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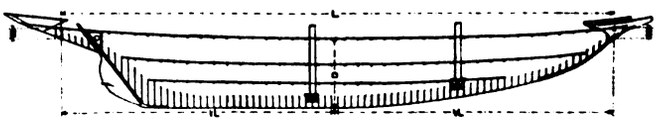

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The scantling numbers are determined as follows:—

The transverse number for scantlings is to be the sum of the half of breadth (½B), the depth (D), the half midship girth (½G), and twice the bilge diagonal (2N), namely:—

Transverse number = ½B+D+½G+2N.

The longitudinal number for scantlings is to be the product of the length (L) and the transverse number (½B+D+½G+2N) where the proportion of length to depth $\left(\frac{L}{D}\right)$ does not exceed seven namely:—

Longitudinal number = $L \times (\frac{1}{2}B + D + \frac{1}{2}G + 2N)$.

Where the proportion of length to depth $\left(\frac{L}{D}\right)$ exceeds seven, the longitudinal number for scantlings is to be the above product multiplied by $\left(\frac{L}{10D} + \cdot 3\right)$.

Equipment number = $L \times (\frac{1}{2}B + D + \frac{1}{2}G + 2N) + 2hl + 2h_1l_1$

and of prominent experts on yacht construction these rules were published in August last year as the results of the best experience available. In the previous rules the scantlings were based on the product of the length by the breadth by the depth of each wood yacht classed in Lloyd's Register. The great variety in the forms and proportions of yachts built in recent years rendered the application of this method in some cases not altogether satisfactory. The former rules for iron and steel yachts based the scantlings on the sum of the depth, half breadth and half girth of the midship section, and on the product of this sum by the length of the vessel. This method was satisfactory in discriminating between fairly full forms of ordinary steam yachts, but was not correct when applied to considerable variations in form, such as that between full formed steam yachts and racing yachts of fine form. The force of this will be seen when it is pointed out that the girth measurement of a fine formed hollow bilge yacht might exceed the similar measurement of a full formed midship section.

"The scantling basis adopted in the latest rules for all types of yachts is practically the same as was formerly used for steel yachts, but with the introduction of the length of the bilge diagonal, to ensure that the finer form shall always have a smaller scantling than the vessel of fuller form. The proportion of length to depth is also introduced in the longitudinal scantling number to provide for an increase in the longitudinal scantling dependent on the increase in the proportion of the length to the depth. A uniform system of scantling numbers is made to apply to wood, composite and

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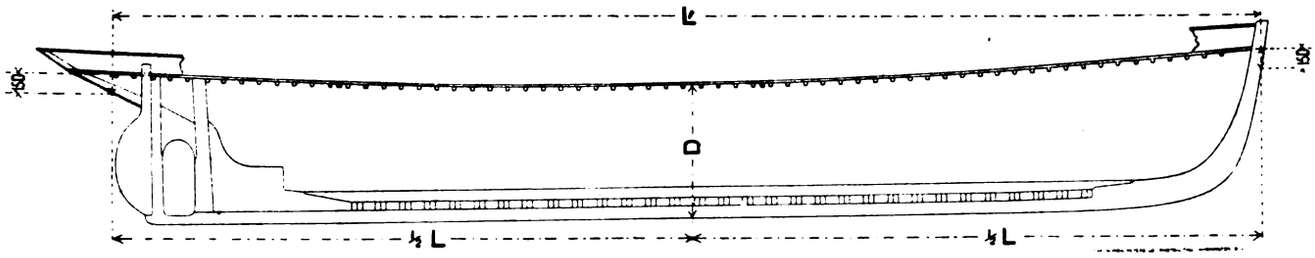

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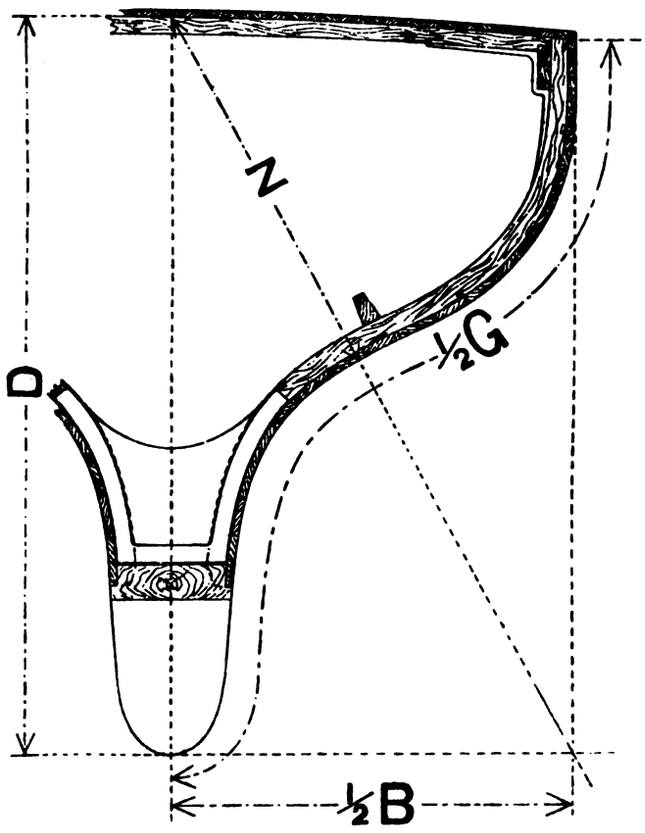
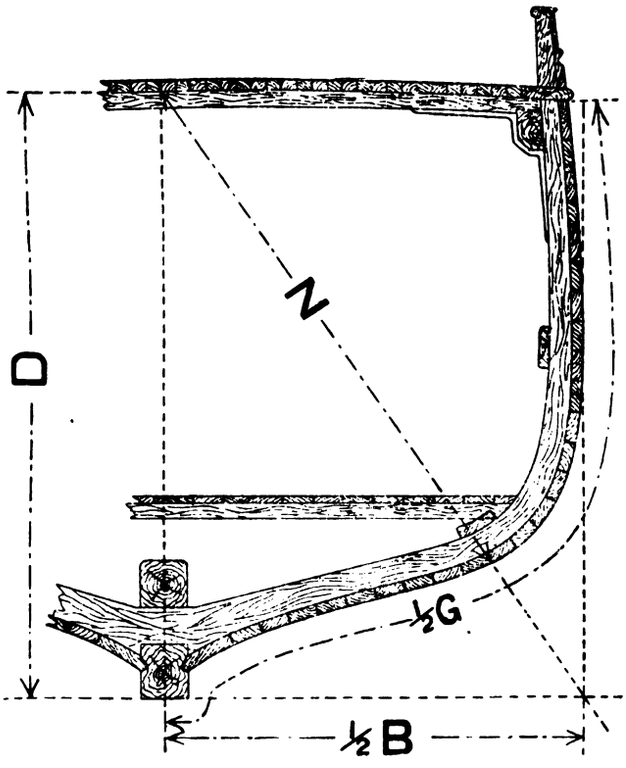


MIDSHIP SECTION OF A SAILING YACHT.



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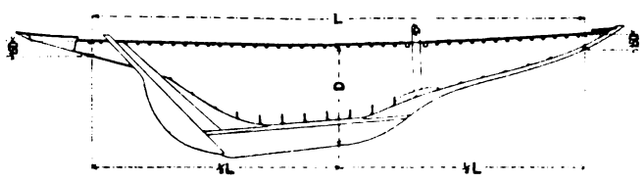

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$$\text{Transverse Number} = \tfrac{1}{2}B + D + \tfrac{1}{2}G + 2N.$$

The Longitudinal Number for scantlings is to be the product of the length (L) and the transverse number ($\frac{1}{2}B+D+\frac{1}{2}G+2N$), where the proportion of length to depth ($\frac{L}{D}$) does not exceed seven, namely:—

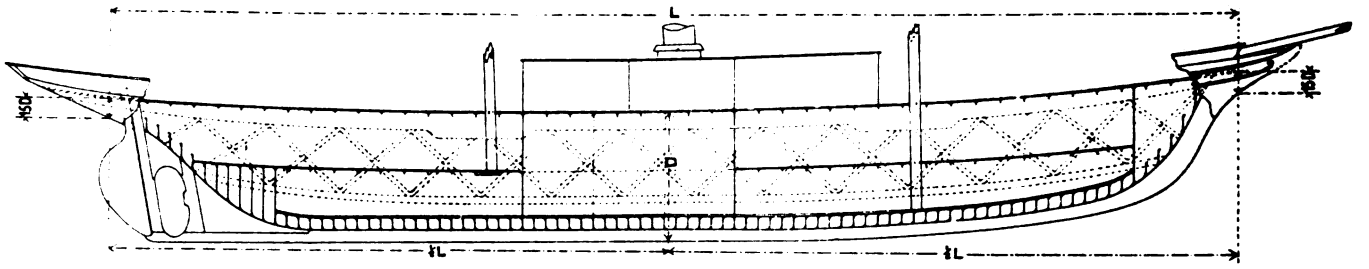
$$\text{Longitudinal Number} = L \times (\tfrac{1}{2}B + D + \tfrac{1}{2}G + 2N).$$

Where the proportions of length to depth ($\frac{L}{D}$) exceeds seven, the longitudinal number for scantlings is to be the above product multiplied by ($\frac{L}{10D}+.3$).

steel yachts, with separate tables of scantlings and rules applicable to each kind of material used in the construction. The principle of the pre-existing rules has been retained as regards the designation of class for steel yachts and for wood and composite yachts.

"Great practical difficulty would arise in providing separate rules for steam yachts, cruisers and racing yachts. It could scarcely be decided in many cases whether a yacht belonged to the cruiser or racer type, seeing that these types gradually merge into one another. Difficulty would also be experienced in considering whether sailing yachts fitted with auxiliary propelling power are or are not to be treated as steam yachts. The scantling basis for all classed yachts has, however, been modified as indicated above, so as to admit the racing yacht while ensuring a strong and durable vessel.

Sketches Illustrating the Method of Determining the Dimensions for Obtaining Scantling Numbers for Composite Yachts.



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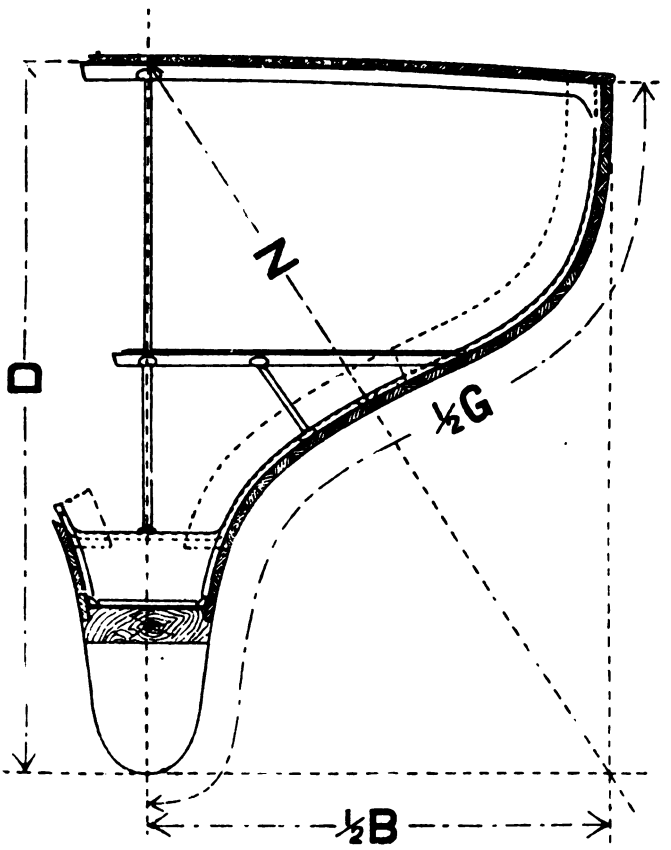

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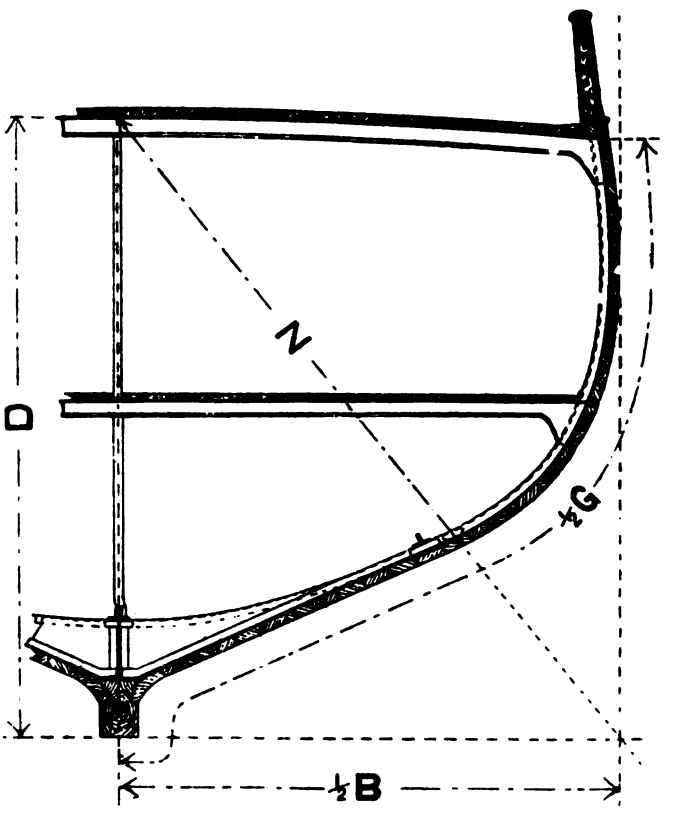

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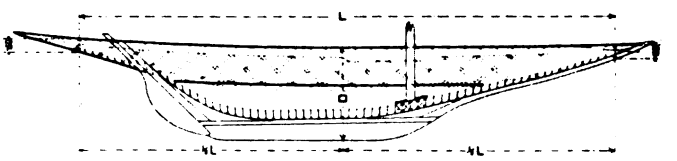

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Transverse Number=½B+D+½G+2N.

The longitudinal number for scantlings is to be the product of the length (L) and the transverse number (½B+D+½G+2N), where the proportion of length to depth $\left(\frac{L}{D}\right)$ does not exceed seven namely:—

Longitudinal number =L×(½B+D+½G+2N).

Where the proportion of length to depth $\left(\frac{L}{D}\right)$ exceeds seven, the longitudinal number for scantlings is to be the above product multiplied by $\left(\frac{L}{10D}+·3\right)$.

"Not only has the basis of the rules been modified, but considerable additions and extensions have been made both in regard to the detail of construction as well as in the tables for the various descriptions of scantlings. Numerous illustrations have been added to the rules showing approved methods of construction commonly adopted in wood, composite and steel yachts, and the manner in which the rules and tables severally apply to them. The numbers that determine the scantlings are arrived at in the following manner, as indicated on Plates 1, 2 and 3 for the methods of taking the required measurements.

"Length.—The length (1) is to be the distance in feet be-

tween the points on the outside of the stem and stern post or counter which are .15 of the rule depth (.15D) below the top of the beam at center.

"Breadth.—The breadth (B) is to be the greatest external breadth in feet of wood and composite yachts, and the greatest moulded breadth in feet of steel yachts.

"Depth.—The depth (D) is to be the depth of the vessel in feet at the middle of the length (L) measured from the bottom of the keel in wood and composite yachts (ballast keel if such be fitted), and from the top of keel in steel yachts to the top of the upper deck beam at center, assuming a normal round-up of beam of one-quarter of an inch to a foot of breadth.

"Girth.—The half midship girth (½G) is to be measured in feet at the middle of the length (L) along the outside of the planding in wood and composite yachts, from the center line at bottom of keel to the top of beams at side of vessel, and along the moulding edge of the frames from the center line at top of keel to the top of beams at side in steel yachts.

"Bilge Diagonal.—The length of the bilge diagonal (N) is to be measured in feet at the middle of the length (L) from the top of the upper deck beams at center to the outside of the planking of wood and composite yachts, and to the moulding edge of the frames in steel yachts, as indicated in the sketches referred to above.

"The transverse number for scantlings is to be the sum of the half breadth (½B), the depth (D), the half midship-girth (½G), and twice the bilge diagonal (2 N), namely:—

"Transverse number $= ½\ B + D + ½\ G + 2\ N$.

"The longitudinal number for scantlings is to be the product of the length (L) and the transverse number ($½\ B + D + ½\ G + 2\ N$), where the proportion of length to depth $\frac{L}{D}$ does not exceed seven, namely:—

"Longitudinal number $= L \times (½\ B + D + ½\ G + 2\ N.)$

"Where the proportion of length to depth $\frac{L}{D}$ exceeds seven, the longitudinal number for scantlings is to be the above product mulitplied by $\frac{L}{10D} + .3$.

"Where the proportion of length to depth is excessive, or where from any peculiarity of design the above method of determining the scantlings does not appear to meet the requirements of the case, a full statement of the circumstances is to be submitted for the consideration of the committee.

"Equipment Number.—The number for regulating the equipment of yachts is to be the product of the length and the transverse number with an addition of twice the product of the length and height in feet of any erections that may be fitted.

"It may be explained that the length defined above includes about one-half of the length of the overhang at each end, and approximates to a load line length without the difficulties arising from the adoption of the latter in cases of alteration of trim or of depth of immersion.

"The society's rules are not intended to be hard and fast, always to be applied in their entirety without deviations. Special clauses are introduced in the rules to meet as far as possible the views of designers, builders or owners who wish to adopt methods other than those set forth in the rules, subject to the standard of efficiency required being maintained. If, therefore, plans of such deviations are submitted to Lloyd's Register and it be found that the necessary strength has been provided for in some other way than that contemplated by the rules, then approval would be given to them. This practice, it may be observed, has been followed with success for many years in dealing with the plans of merchant vessels.

"With regard to local strains in yachts it will be found that the rules provide for local strengthening in way of the masts and rigging of sailing yachts in way of the heavy ballast abreast of the machinery space in steam yachts and at other parts.

"Numerous small guides are introduced in the tables of scantlings so as to avoid as far as practicable the paring of the dimensions of a yacht with a view to getting the lowest possible scantlings in the construction. No important reduction of scantling is possible under these rules by the adoption of such practices.

"Apart from the question of basis the systems of construction of the smaller type of wood yachts have been made to accord with general practice of the present day. Definite rules have been framed for composite yachts to take the place of the general rules previously in operation for such yachts, and the rules throughout have been brought up to date.

"It is scarcely necessary for me to enlarge on the advantages to an owner wishing to sell his yacht when he is in a position to show that it has been built under the special survey of the surveyors to Lloyd's Register in accordance with the latest rules of the society and that it is classed in the society's Yacht Register. In conclusion I wish to state that the rules for the building and classification of yachts, although based upon the best practice of the day, are open to amendment in any respect in which experience may show this course to be desirable. The views of designers, builders and owners in regard thereto will always receive careful consideration by Lloyd's Register in order that the rules may continue to represent the experience of the highest authorities in yacht construction."

IRON ORE SHIPMENTS BY LAKE

Final returns regarding iron ore shipment by lake for 1904 show an aggregate of 21,226,591 gross tons. This does not include 76,606 tons shipped to Lake Erie ports from the Lake Superior Corporation's mines in the Michipicoten range in Canada. Neither does it include the shipments by rail to furnaces near the mines which will probably be, as formerly, in the neighborhood of 500,000 tons. This will bring the grand total to nearly 22,000,000 tons. The grand total in 1902 was 27,571,121 tons of which 27,039,169 tons were shipped by lake; in 1903 the grand total was 24,281,595 tons of which 23,649,550 tons was shipped by lake. Between lake shipments of this year and last there is only a difference of 2,303,232 tons which, considering the brevity of the season, is somewhat remarkable. In the table of shipments by ports for the past five years, published below, it will be seen that during the season just closed Gladstone practically ceased to be a shipping port, sending forth only 480 tons of ore. Following is the table:

	1904	1903.	1902.	1901.	1900
Escanaba	3 644,267	4 277,561	5.413 704	4,022,668	3,436,734
Marquette	1,907,301	2,007,346	2 595,010	2,354 284	2,661 861
Ashland	2,288,400	2,823,119	3.553,919	2,886 252	2,633 687
Two Harbors	4,506,542	5,120 656	5,605,185	5,018,197	4,007.294
Gladstone	480	35,816	92,375	117,089	418 854
Superior	4,169,990	3,978,579	4,180,568	2.321,077	1,522,899
Duluth	4,649,611	5,356,473	5,598,408	3,437 955	3,888,986
Total, by lake	21,226,591	23,649,550	27,039,169	20,157,522	18,570,315
Total, all rail		632,045	531,952	431,715	489,078
Total shipments		24,281,595	27,571,121	20,589,237	19,059,393

Pickands, Mather & Co. of Cleveland have taken an option on the St. Clair iron property that lies two miles east of Pewabik on Embarrass lake, and the prospective new lessee has given a contract to Cole & McDonald to make tests. It is reliably stated that George A. St. Clair of Duluth, who controls the land, has shown up 5,000,000 tons of high grade ore.

DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

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DEC. 22, 1904.

The Board of Supervising Inspectors of the steamboat inspection service have just adjourned after an eight weeks' session in Washington considering changes in the rules governing the inspection of vessels as a result of the burning of the steamer General Slocum in New York harbor with enormous loss of life. Secretary Metcalf of the department of commerce and labor has approved a number of the changes recommended by the Board of Supervising Inspectors and has made them public. A number of these changes were undoubtedly embodied in the report of the commission appointed to investigate the Slocum disaster, but it would be more to the point if it were definitely known that they were also embodied in the report of the Board of Supervising Inspectors framed more than two years ago but which was never acted upon by the new department of commerce and labor. It is known, however, that one of the changes recommended in the report just made public was also recommended in the original report of the Board of Supervising Inspectors and that is the connection of steam pipes in lamp lockers. Such a connection, if properly availed of at the time of the Slocum disaster, would have effectually prevented that occurrence. The changes which have been made in the rules for preventing and fighting of fire will unquestionably, if enforced, reduce the danger of fire to a minimum. One thing which the Board of Supervising Inspectors were required by statute to do, however, at their recent meeting will undoubtedly result in mischief or hardship or both unless remedied later. This is the result of the Piedmont decision whereby the attorney general held that the Board of Supervising Inspectors should assign crews to every steamer operating in the United States. Obviously the Board of Supervising Inspectors sitting in Washington can have no personal knowledge of the requirements of every steamer in the United States. They cannot know the route, the length of run or hours of service and yet under the Piedmont decision they must personally determine how many men should constitute the crew of each steamer. The board went through with the labor of doing this and was guided solely by the tonnage of the vesssel. Such a guide, however, is not sufficient if the length of run is not known. Hitherto this work has been done by the local inspectors.

Secretary Metcalf has given the various steamship lines until Jan. 16 to file objections to the recommendations of the board. The board will meet again at that time to consider them. It would be well for the representatives of every passenger line in the United States, including the great lakes, to be present at that time, otherwise rules will pass into force which will work in many instances more harm than good. The United States is a mighty big country and it is difficult to make rules that can be impartially administered in all parts of it. For instance one of the provisions of the new rules is that one watchman must be carried for every 250 passengers. This would require the excursion steamers operating in the Detroit river, a perfectly safe waterway, relieved by nature from any violence of the elements, with the shore within a couple of minutes reach, to carry about fifteen watchmen each. Such a provision in so far as this particular service is concerned is absurd.

Another provision which is likely to give vesselmen on the great lakes some concern is that in relation to bulkheads. The recommendations provide that for passenger boats there should be bulkheads for every 80 ft. of length. A great many of the ore freighters on the great lakes are licensed to carry passengers and would be included in a literal interpretation of this regulation. However, it would be obviously impossible to subdivide the hull of the ore carrier by bulkheads and at the same time it would be a hardship to deprive the owner of a vessel of the privilege of inviting guests to take a trip on his own boat. This, and various other regulations make it imperative that lake men should send representatives to Washington to see that some of the regulations are amended or that latitude is allowed in their interpretation.

Among the representatives who have already appeared before the secretary are the following: James A. Henderson of Pittsburg, president of the National Board of Steam Navigation and president of the Pitts-

burg & Cincinnati Packet Line; Henry L. Desanges of the National Board of Steam Navigation; Chauncey G. Whiten of the New Bedford, Marthas Vineyard & Nantucket Steamboat Co., and the Nantasket Steamboat Co.; Horace Wilson of the Wilmington Steamboat Co.; Edwin H. Duff of the Philadelphia Maritime Exchange; John Callahan of the Norfolk & Washington Steamboat Co.; Frank B. Green of the New York Board of Trade and Transportation; Thomas Clyde of the Clyde lines; Alex R. Smith of the New York Maritime Association; William C. Eliason of Baltimore of the Tolchester Steamboat Co., and John M. Blankenship of the Merchants & Miners Transportation Co. of Baltimore.

Information from Washington is to the effect that the bill drafted by the Merchant Marine Commission based upon the evidence submitted to it by merchants, manufacturers and others during its recent tour of the United States will be presented to congress before the holidays unless there is a change in the present program. In its general features the bill will advocate the imposition of an additional tonnage tax upon all vessels and the granting of subventions for the establishment of new mail routes. It is the plan to grant to American vessels which conform to certain conditions and render definite service in the upbuilding of a naval reserve a certain stipulated sum based upon gross tonnage and it is the expectation that the additional tonnage tax will provide the means to do so. In this manner there would be no drain upon the public treasury. The underlying purpose is to encourage the cargo carriers, both sail and steam. As far as can be gathered from interviews, both Democratic and Republican, there is little practical opposition to legislation for the promotion of shipping in the foreign trade and it is quite likely, therefore, that a measure will be placed upon the statutes during the present session. At any rate, it is high time that something is done if the American flag is to remain in the foreign trade.

BIDS FOR ERIE CANAL ENLARGEMENT

In the presence of nearly one hundred engineers representing contracting firms in various parts of the country, Mr. Boyd, the superintendent of public works, opened the first bids last week for the construction of the $101,000,000 1,000-ton barge canal. Bids were received on two contracts only, involving an estimated expenditure of about $2,000,000. Only two proposals were received for contract No. 1, the remainder being for No. 2, which involves an estimated expenditure of $1,176,000, and calls for the excavation of the canal from the Mohawk river to a point about one-quarter of a mile west of the head of lock No. 3, with the construction of locks Nos. 2 and 3. Contract No. 1 calls for an estimated expenditure of $712,000 on the following work: excavating the upper Hudson river channel for the Champlain canal from Northumberland to Fort Miller and from Crocker's reef to Fort Edward, a distance of 7 miles, with the construction of Crocker's reef dam. With few exceptions the bids come within the estimates of the canal engineers. Few of the bidders named a lump sum for the work. Each bid, however, was accompanied by a certified check for at least 5 per cent of the entire cost, from which the following estimates of prices are made:

Contract No. 1—Lindon W. Bates, New York city, $605,008; John Dunfee & Co., Syracuse, $712,000.

Contract No. 2—Ryan Brothers, New York city, $969,290; Continental Engineering & Contracting Co., Buffalo, $1,040,000; Broadhead Contracting Co. (Incorporated), Wilkes-Barre, Pa., $945,655; Casey & Murray, Rochester, N. Y., $960,000; Losier, De Graff Construction Co., Buffalo, $1,600,000; Lindon W. Bates, New York city, $988,026.60; United Engineering & Contracting Co., New York city, $869,000; Atlantic, Gulf & Pacific Co., New York city, $1,100,000; the Church Construction Co., New York city, $980,000; John Dunfee & Co., Syracuse, $1,176,000; the Eastern Contracting Co. (Incorporated), Pittsburg, Pa., $1,000,000; T. A. Gillespie, New York, $1,100,000.

Later eleven bids were opened by Superintendent of Public Works Boyd for contract No. 3 of the 1,000-ton barge canal work, and four bids for contract No. 4. Nearly all the bidders presented proposals also for contracts 1 and 2. Contract No. 3 calls for the excavation of the Champlain canal from below Fort Miller lock No. 60 to above the guard gate at Crocker's reef; the construction of the Fort Miller lock and a bridge. Contract No. 4 calls for the construction of the Erie canal from Lock 25 to deep water east end of Oneida Lake at Sylvan Beach, a distance of 4.83 miles. All the bids seem to be under the engineer's estimates, which were: $874,000 for contract No. 3 and $934,000 for contract No. 4. The bidders today and their lump-sum bids or 5 per cent deposits were as follows:

For Contract No. 3.—Church Construction Co. of New York, $698,000 (lump sum); United Engineering & Construction Co. of New York, $699,000 (lump sum); Mosier-Degraff Construction Co. of Buffalo, $39,500 (5 per cent deposit); Lindon W. Bates, $36,449.68 (deposit); Buckley Construction Co. of Schenectady, $38,000 (deposit); Broadhead Construction Co., Inc., of Wilkesbarre, $47,282.75 (deposit); Eastern Construction Co. of Pittsburg, Pa., and Troy, $40,000 (deposit); Sundstrom & Stratton of New York, $40,000 (deposit); E. A. Gillespie Co. of New York, $43,000 (deposit); John Dunfee & Co. of Syracuse, $43,700; MacArthur Bros. Co. of Chicago, $40,000 (deposit).

For Contract No. 4.—Henry P. Burgard of Buffalo, $40,000 (deposit); Atlantic, Gulf & Pacific Co. of New York, $45,000; John Dunfee & Co., Syracuse, $46,700 (deposit); Lindon W. Bates of New York, $36,340.75 (deposit).

SCHEDULE OF WAGES WITH ENGINEERS

The annual meeting of the Marine Engineers' Beneficial Association will take place in Washington on Jan. 16. For several years past vessel owners have dealt as a body with the marine engineers in classifying the vessels and fixing the schedule of wages and in all probability the schedule of 1905 will have been decided upon before the annual meeting of the marine engineers occurs in Washington. The conference, as far as the Pittsburg Steamship Co. is concerned, would have been held this week, but so many of the engineers are busy laying up their boats that it was postponed. Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., stated this week that the date for the conference had not been fixed but would be arranged as soon as he could get at it. No trouble whatever is anticipated in reaching an agreement satisfactory to both sides.

The freighter building at the Lorain yard of the American Ship Building Co. for the Buffalo & Susquehanna Steamship Co. will be named for Stephen M. Clement of Buffalo. Mr. Clement is the president of the Marine National Bank of Buffalo.

THE LAUNCHING PARTY ON THE LAUNCHING STAND, THE FOUR FIGURES IN THE CENTER FOREGROUND BEING MR. E. T. EVANS, MR. J. C. EVANS, MISS EDWINE NOYE AND MR. J. C. WALLACE.

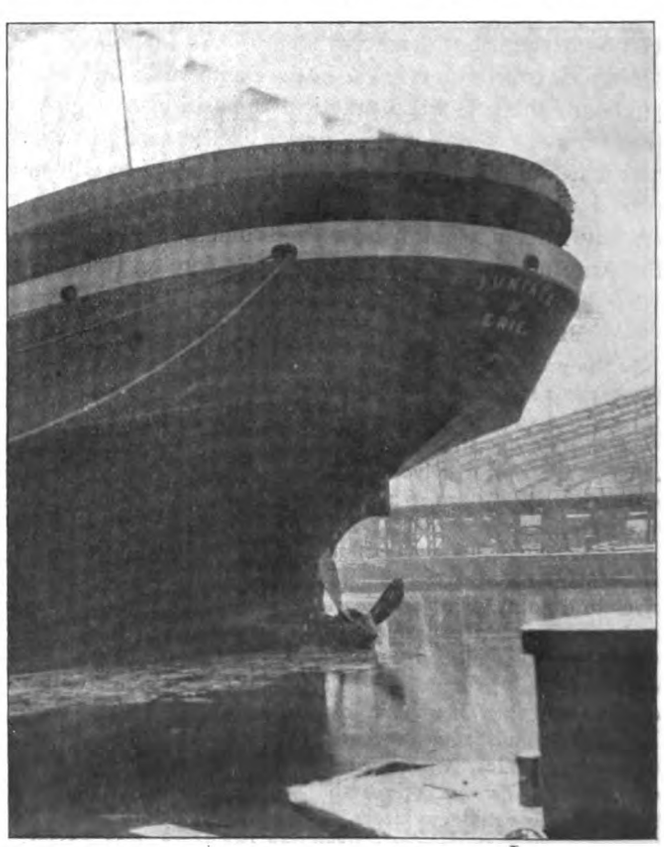
LAUNCH OF THE JUNIATA

MISS NOYE AIMS THE BOTTLE.

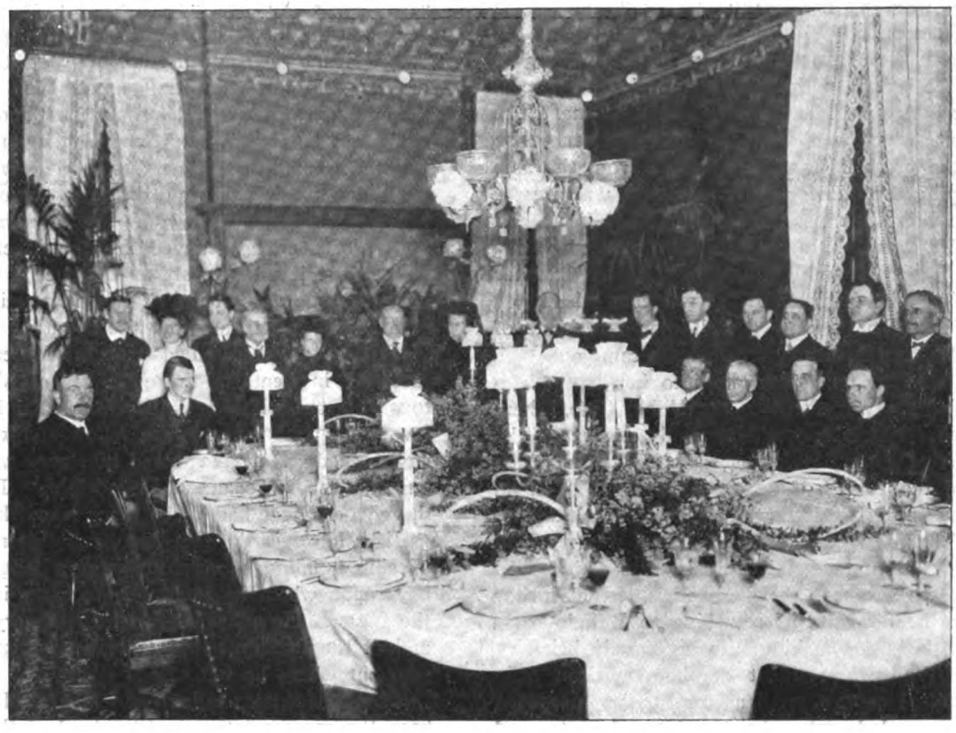
A notable addition was made to the fleet of lake craft last Saturday when the new combined passenger and package freight steamer Juniata was launched from the Cleveland yard of the American Ship Building Co. for the Anchor Line in the presence of thousands of persons who had assembled to witness the event. The steamer was scheduled to be launched at 11 o'clock, but as the entire launching party was present she was launched five minutes ahead of that time. The launching was one of the most successful in the history of the ship building company and passed off with remarkable smoothness. The Juniata was christened by Miss Edwine Noye of Buffalo, granddaughter of Mr. E. T. Evans, vice-president of the Erie & Western Transportation Co., for which the steamer is building. Miss Noye smashed the customary bottle of champagne with much vigor. She was accompanied by her mother, Mrs. Albert Anderson Noye, Miss Greenough. Mr. E. T. Evans and Mr. J. C. Evans, western manager of the Anchor Line. Those on the launching stand in addition were: Mr. Walter Thayer of Philadelphia, eastern manager of the Anchor Line; Mr. C. J. Fox, chief engineer at Buffalo; D. M. Brigham, special agent at Cleveland; B. E. Bourke, agent, Detroit; John Marron, agent, Cleveland; Capt. Edward Martin, Buffalo; Mr. H. T. Andrus, agent Pennsylvania Railroad, Cleveland; Mr. James C. Wallace, president American Ship Building Co.; Mr. Robert Logan, general manager American Ship Building Co.; Mr. Russel C. Wetmore, assistant general manager American Ship Building Co., and Miss Wetmore; Mr. Robert Wallace, Sr., and Mr. Robert Wallace, Jr., of the American Ship Building Co.; Mr. Edward Hopkins, American Ship Building Co.; Mr. J. J. Shepard, and Mr. George W. Hausheer of Cleveland.

The Juniata, which is the first steamer of its kind to be built in Cleveland since the Northwest and Northland were launched about nine years ago, is practically a duplicate of her sister ship the Tionesta, which during the past two years has been one of the most popular boats on the lakes. The only notable addition on the new steamer, as compared with the Tionesta, will be six parlor staterooms on the upper deck, just aft of the texas. The main deck, with the exception of the engine space and small social hall, will be devoted entirely to freight, as will the hold. The promenade deck will be devoted to staterooms and the offices of the purser and steward.

The engines in the new ship will be of the quadruple-expansion type, same dimensions and power as those on the Tionesta, namely, cylinders 22 in., 31½ in., 45 in. and 45 in. di-



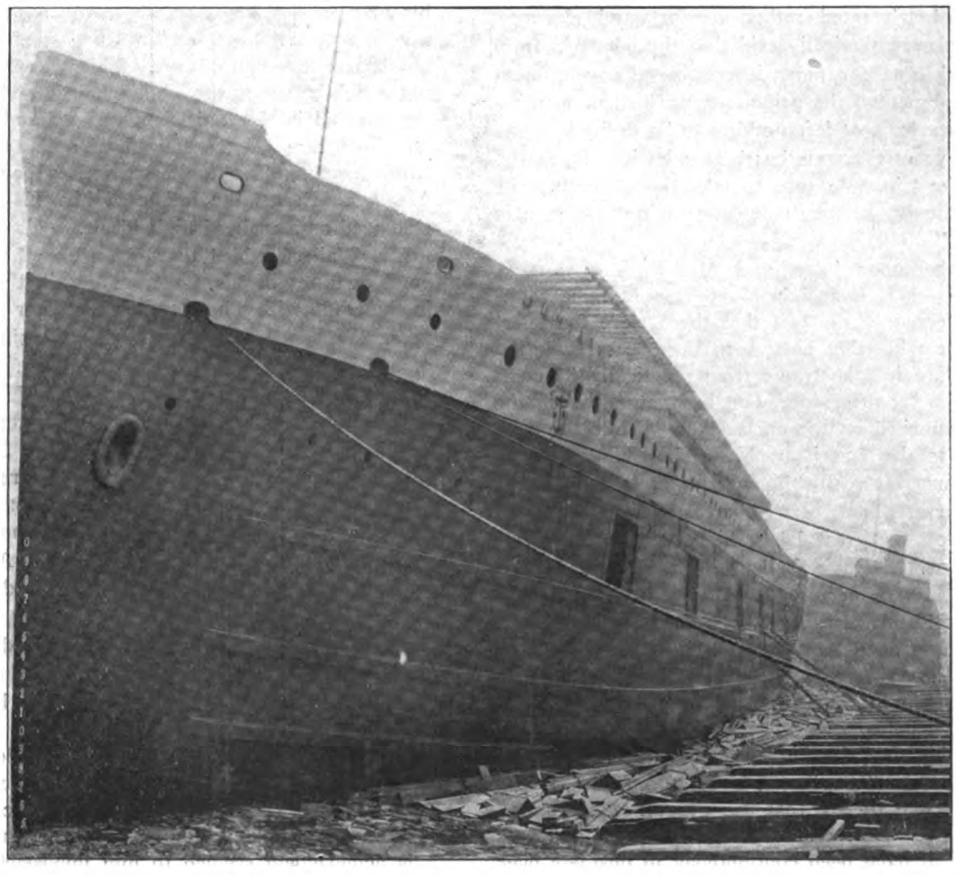
STERN VIEW OF THE JUNIATA.



THE DINNER AT THE UNION CLUB.

ameter with a common stroke of 42 in. Steam will be supplied by four cylindrical boilers, 12 ft. 6 in. diameter by 11 ft. 3 in. long, each fitted with two 44 in. inside diameter corrugated furnaces and 242 3 in. tubes 7 ft. 9 in. long between tube plates, the boilers being built for a working pressure of 210 lbs. and fitted with Howden system of hot draft. The machinery of the vessel is designed for an average of 2,500 H. P. with 100 revolutions per minute. The contract provides that the new boat shall be completed in time for the opening of navigation 1905. Her speed will be about 16 miles per hour. With the latest addition the Anchor Line will have a fleet of five passenger steamers operating between Buffalo and Duluth, stopping at Erie, Cleveland, Detroit, Mackinac Island, Sault Ste Marie, Marquette and Houghton.

The general dimensions of the Juniata are as follows: Length over all, 360 ft.; length of keel, 340 ft.; beam, 45 ft.; depth, 28 ft. The hull construction is of steel up to the promenade deck. The hull is divided into nine watertight compartments by eight bulkheads. There is a double bottom with a water ballast capacity of 900 tons. The cargo capacity is 3,500 tons, coal bunker capacity 350 tons, and total passenger capacity 350. A feature of this vessel, as well as of the Tionesta, is the location of the dining saloon and social hall, which is situated on the deck above the sleeping cabins. The entrance for first class passengers is located amidship on the main deck, and occupies a space of 20 ft. in length, extending entirely across the ship, from which broad stairs lead to the berth deck. The berth deck occupies the full width of the ship and is arranged with four lines of staterooms extending from the forward bulkhead to the stack. The rooms are exceptionally large, each containing two berths, a cushioned sofa, porcelain lavatory supplied with water under pressure, electric lamps and service calls. There will be a covered stairway leading from the promenade deck to the awning



THE JUNIATA, TAKEN IMMEDIATELY AFTER THE LAUNCH

deck. Instead of windows the steamer will have dead light same as ocean steamers.

A most interesting circumstance in an historical way in connection with the launch of the Juniata was the presence of Mr. E. T. Evans, vice-president of the Anchor Line. The steamer Merchant, which was the first iron steamer to be constructed on the great lakes, was launched from the ship yard of David Bell at Buffalo for Mr. Evans, who was present at the time. The Merchant was 200 ft. long, 29 ft. beam and 14 ft. deep, and of 720 tons burden. She was propelled by one direct-acting condensing engine with cylinder 40 in. diameter by stroke of 36 in. The diameter of the propeller wheel was 10 ft. Capt. Albert Briggs, now a well-known resident of Buffalo, was captain of the Merchant when she came out.

After the Juniata had taken her dip into her native element the launching party repaired to the Union Club, where dinner was served. The table was beautifully decorated, the prevailing hue being green, which is the color with which all the vessels of the Anchor Line are painted. The menu was simple and elegant. It was served with excellent thought, as was evidenced by the fact that the ice cream was modeled after the lines of the Juniata and the cake was emblazoned with the name of the steamer. As the officials of the Anchor Line were under the necessity of returning to Buffalo early in the afternoon, the speechmaking was necessarily brief.

Mr. James C. Wallace, president of the American Ship Building Co., who, of course, acted as toastmaster, proposed a toast to the young lady who christened the Juniata, and she, with infinite self-possession and tact, rose to her feet immediately thereafter and proposed a toast to "Mr. Firth and My Grandfather." Mr. Wallace then stated that the next person whom he would introduce would be a gentleman who in his judgment was possessed of a great deal of wisdom and forethought, a gentleman who believed that there was a considerable element in the population who desired to take a trip up the lakes, but who did not desire to be rushed through and back again, but wanted rather comfort and elegance. Mr. Wallace then parenthetically said that the lake trip from Buffalo to Duluth was far more interesting than an ocean voyage, and complimented the person whom he had in mind for providing a service that left nothing to be desired. During the past two years everyone has been advising those who contemplate a lake trip, "Be sure to take the Tionesta;" he thought that in the future they would be saying "Be sure to take the Juniata."

Mr. Wallace thereupon introduced Mr. E. T. Evans of the Anchor Line. Mr. Evans' brief address was most impressive. He referred to the fact that there were four persons seated at the table that have seen the great revolution that has taken place in lake traffic from practically its commercial beginning. Of these four, two had actually seen the first metal ship launched on the great lakes. While the gunboat Michigan was the first iron ship to be built upon the lakes, the Merchant was really the forerunner of the present mighty fleet of metal ships. Mr. Robert Wallace, the nestor of ship building on the great lakes, had seen the Merchant launched at the yard of David Bell at Buffalo, N. Y., and it was built for Mr. Evans personally.

"This event," said Mr. Evans, "took place in 1862. Just think what has happened since. See what has grown up around us in these few years. Consider, you young men, what is ahead of you in the next thirty or forty years that you shall live. I want to say, however, that Mr. Wallace is mistaken in thinking that the Tionesta and Juniata represent a new venture. We built the India, China and Japan in 1872 for precisely the same service that the Tionesta and Juniata are now performing. They were up-to-date freight and passenger steamers and have been continuously in business ever since. They were as up to date in their time as the Tionesta and Juniata are now, and I hope to see a great many more added to the fleet, keeping things right up to the mark."

Mr. Evans then added incidentally that he had never seen a finer ship than the Juniata, not even on the ocean. He thought that in general proportions and bulk the Juniata could not be improved upon, and that any one ought to be satisfied to live on her as though they were living at home. He did not think that any home in arrangement or in convenience could be more conducive to comfort than the Juniata. Moreover, he believed that the American Ship Building Co. had achieved a record in the speedy construction of this ship and one that ought to give it prestige not only on the great lakes, but throughout the country.

Mr. Wallace then called upon his father, Mr. Robert Wallace, for incidents in the early life of Mr. Evans. With a touch of rare wit Mr. Wallace said that he remembered Mr. Evans when he was a young fellow and knew his father very well indeed. He remembered him very well when they were building the Merchant at Philadelphia. He spoke briefly of the changes that had taken place since that time and of his gratification over the fact that having carried on the business of ship building successfully over a long life he had three boys upon whom he could rely to carry it on successfully in the future. He admitted that he was very proud of his sons and of the fact that they were beginning, not where he began, but where he left off.

Mr. Wallace then called upon Mr. D. M. Brigham, who has been the representative in Cleveland of the Anchor Line for a great many years. Mr. Brigham made a very illuminating address, though it was necessarily very brief. His first business with the line was as clerk of the steamer Allegheny, which was owned by Mr. Evans. The Allegheny was a steamer of 475 tons and drew 12 ft. of water. Even at that she grounded on her first trip in Lake St. Clair and was not released for twenty-four hours thereafter. Her fuel bill for a round trip at that time was $1,200. Mr. Brigham related his first trip to Petosky, where the passengers were carried ashore in small boats and the live stock was simply pushed oevrboard to swim ashore. This was in 1854. There was not a lighthouse on the whole chain of lakes at that time and the channel in St. Clair flats was marked with poles. When one boat came along and hit a pole the next boat would surely ground. He took occasion to pay a great tribute to Mr. J. C. Evans, the father of Mr. E. T. Evans, whom he eulogized as a man of high ideals.

Mr. Wallace added that Mr. Evans had succeeded to the good qualities of his father, and said that there is no man in the trade with whom it was a greater pleasure to do business. Whenever he engages in a business transaction his money is always there on the day that he agrees.

Mr. Wallace then introduced Mr. H. T. Andrus of the Pennsylvania railway, relating a characteristic little anecdote of his first meeting with Mr. Andrus. He said that it was in the early days of his ship building career and that he was very desirous of getting a certain car containing material for immediate use that had been knocking about in the local yard for twenty-four hours. He asked Mr. Andrus how long it would take to get the car. Andrus strode up and down the room once or twice and then said: "It will take about ten minutes." Mr. Andrus said that he and Mr. Brigham had begun business practically at the same time. He began railroading in 1858, when the coaling of boats was done by wheelbarrows. It would have taken, he stated, about three months to load the steamer Wolvin under those conditions, and paid a great tribute to the men who loaded this vessel with 287 cars containing 11,000 tons of coal in a continuous performance without stopping for darkness. He said that this achievement seemed to him impossible, though he knew it to be true. What he meant was that the evolution had

been so rapid and so great that it seemed incredible to think that 10,000 tons could be taken out of a vessel in a little over four hours, whereas even in his recollection to take out only 400 tons was a matter of five or six days' work. He added that when he began railroading it was in its infancy, and he was of the opinion that it was yet in its infancy. He thought that the future would see changes quite as great as those of the past. He could not conclude his address without hoping that the Anchor Line would have a home in Cleveland and dock of its own the same as it has in Erie.

As Mr. Evans and his son were under the necessity of taking the three o'clock train to Buffalo, Mr. Wallace brought the speechmaking to a close by saying, "I propose a toast to the Tionesta and the Juniata and the six other vessels which we are to build for the Anchor Line."

This was most happy phrasing and every one drained their glasses to it.

SAULT CANAL SEMI-CENTENNIAL CELEBRATION

The month of July, 1905, will mark the rounding out of the first fifty years' usage of the Lake Superior ship canal in the state of Michigan and the commencement of the second half of its first century in history. This event will measure the commercial and industrial progress of the lake region, of the United States, and of the world as no other can, and is entitled to special prominence, as a matter of public interest and national policy.

The statistics of the increase of marine tonnage capacity which it affords, with proofs of the revolution in the lake marine styles of waterway conveyance, are most accurate and convincing.

In July, 1855, the major part of the lake marine was composed of sail vessels, now obsolete as freighters. The shipments of 100 tons of iron ore at Marquette, then the only mining outlet of that kind, taxed its facilities to the utmost. Loaded by wheelbarrows on to the side-wheel passenger steamers, it was considered a doubtful commercial experiment. The cost of loading was over 50 cents per ton, the detention to the steamer consumed many hours and the freight charges were about $3 per ton. Contrast these conditions with fifty years later, when steamers like the Wolvin can load 10,000 tons in an hour or so and discharge the same in four or five hours. In 1855 the total shipments of iron ore from Lake Superior was 1,449 tons; in 1904 it was 21,226,591 tons, being reduced by strike and other causes from 27,439,169 tons in 1902 and will probably reach 30,000,000 tons in 1905.

In 1855 the commerce of Lake Superior attracted but little attention in Cleveland or elsewhere. Now its loss would mean the financial ruin of Cleveland and of Pittsburg, and of national iron and steel interests, controlling to a degree the markets of the world.

Surely such verities as these are worthy of a "jubilee" celebration. Certain preliminary steps have been taken in that direction, but the onus rests with congress, as its sanction must be first obtained. Suitable bills were introduced last year, but the then approaching presidential election and the St. Louis fair overshadowed this plan. Those being passed, the way is now clear and this should come to the very fore front.

Citizens of the Sault have started an organization under the name of the Great Lakes Sault Canal Semi-Centennial Celebration Association and invited general co-operation by a judicious selection of leaders, naming Hon. Peter White of Marquette, the famous Lake Superior pioneer, as president, and Messrs. Wm. A. Livingstone of Detroit, president of the Lake Carriers' Association, and Charles T. Harvey of Ottawa, Ontario, the supervising engineer of the original canal construction, as vice-presidents; Otto Fowle, president First National Bank of Sault Ste. Marie, treasurer; and T. R. Esterday of Sault Ste. Marie, corresponding secretary; a central office and agency to be established as soon as congress takes necessary action, and in the obtaining of which the co-operation of the Chamber of Commerce and Legislature of the great lake region is solicited. The minimum amount to be asked of congress is $25,000--$10,000 of it for a monolith monument bearing historical tablets and $15,000 for printing and incidental expenses. There is another feature proposed, which is that the lake states make it the occasion of tendering an excursion around the lakes to the members of congress of both this and next year's sessions, as a recognition of federal liberality in appropriations providing for enlarging the canal and its approaches in the St. Mary's river to the extent of many millions of dollars, and for improving lake harbors and waterways at an enormous aggregate cost. Mr. Charles T. Harvey, who was in Cleveland this week, said:

"The excursion can be easily arranged by chartering two or three of the largest lake passenger steamers, such as the Northwest and Northland, and, starting at Buffalo, make the round trip of Lakes Erie, Huron, Michigan and Superior, stopping at the principal ports en route and affording ample time and accommodations at the canal celebration. This will be the grandest affair of its kind in our national history and make ample returns to the lake states in advertising most effectively their natural and industrial resources, at a less cost than in any other way. An appropriation of from $15,000 to $25,000 from each lake state will provide the means for most satisfactory results."

NAVAL RETIREMENTS

Eight rear-admirals, four captains, one medical director, two pay directors, one chief boatswain, one chief gunner, and one warrant machinist will be placed on the retired list for age next year. Rear-Admiral Albert S. Barker, commanding the North Atlantic fleet, will leave the service on March 31; Rear-Admiral H. T. B. Harris, paymaster-general and chief of the bureau of supplies and accounts, on April 5; Rear-Admiral Yates Stirling, commanding the Asiatic fleet, on May 6; Rear-Admiral William H. Whiting, commandant of the naval training station at San Francisco, on July 8; Rear-Admiral Francis J. Higginson, commandant of the Washington yard, on July 19; Rear-Admiral Charles E. Clark, president of the naval examining and retiring board, on Aug. 10; Rear-Admiral Charles J. Barclay, commandant of the Puget Sound yard, on Sept. 8, and Rear-Admiral George W. Pigman, commanding the receiving ship Wabash at the Boston yard, on Dec. 19. The four captains are engineer officers, and will go out on the following dates: Capt. J. A. B. Smith, captain of the New York yard, on March 21; Capt. Robert W. Milligan, on duty at the Norfolk yard, on April 8; Capt. George W. Baird, on duty in Washington, on April 22, and Capt. Richard Inch, inspector of machinery at Newport News, Va., on June 29; Medical Director William G. Farwell, on April 5; Pay Director Ichabod Hobbs, on March 13, and Leonard A. Frailey, on Aug. 8; Chief Boatswain Timothy Sheean, on Nov. 1; Chief Gunner John J. Walsh, on May 10, and Warrant Machinist John S. Hothersall, on Oct. 8. Col. Percival C. Pope is th eonly marine corps officer who will retire for age in 1905.

The retirement of the above rear-admirals will cause the promotion to that grade of Capts. Charles M. Thomas, Albert S. Snow, George C. Reiter, Willard H. Brownson, William W. Mead, Edwin Longnecker, and Thomas Perry, leaving Charles H. Stockton the senior captain of the line. Capt. Joseph E. Craig, now the senior captain, will be promoted to rear-admiral on the retirement for age of Rear-Admiral Silas W. Terry, on Dec. 28.

AVERAGE LAKE FREIGHTS

There is presented herewith with the close of another season the usual summary of lake freights. It will be noted that the wild or daily rate and the contract rate are approximately equal. This has been the tendency for some years. It is interesting to observe that the wild and contract rates from Marquette averaged for the past twenty years, come out at the same figures. The excitement of former years with a wildly fluctuating rate as the season advances is no longer a feature of the market. The rates hold steady throughout the year. The Steel Corporation made season contracts for the movement of ore on July 15 at 70 cents from the head of the lakes, 60 cents from Marquette and 55 cents from Escanaba. Other shippers had by that time made season contracts from Marquette at 65 cents. Season contracts were made on soft coal from Ohio ports on June 20 at 35 cents to the head of the lakes, and 45 cents to Lake Michigan and the wild rate which had been 5 cents higher fell to these figures on June 25. The same rates were maintained until the closing days of navigation when 75 cents was paid for coal both to the head of the lakes and Lake Michigan. The different summaries of average rates are as follows:

AVERAGE DAILY RATES OF FREIGHT ON THE GREAT LAKES.

	1904. Cents.	1903 Cents	1902. Cents
Iron ore, Escanaba to Ohio ports	53.6	60.9	58.8
Iron ore, head of Lake Superior to Ohio ports, gross ton	70.3	80.9	77.2
Iron ore, Marquette to Ohio ports, gross ton	62.4	72.1	66.1
Wheat, Chicago to Buffalo, bushel	1.3	1.4	1.5
Wheat, Duluth to Buffalo, bushel	1.8	1.6	1.9
Soft coal, Ohio ports to Milwaukee, net ton	47.4	50.7	46.7
Soft coal, Ohio ports to Duluth, net ton	37.1	41.5	34.5
Soft coal, Ohio ports to Portage, net ton	35.6	40.0	31.8
Soft coal, Ohio ports to Manitowoc, net ton	40.6	45.9	41.9
Soft coal, Ohio ports to Sheboygan, net ton	40.6	45.9	41.9
Soft coal, Ohio ports to Green Bay, net ton	45.6	50.7	46.7
Soft coal, Ohio ports to Escanaba, net ton	40.6	45.0	41.4
Hard coal, Buffalo to Milwaukee, net ton	43.4	48.1	42.3
Hard coal, Buffalo to Chicago, net ton	43.4	48.1	42.3
Hard coal, Buffalo to Duluth, net ton	33.9	38.1	32.8
Lumber, head of the lakes to Ohio ports	254.0	257.6	254.9

AVERAGE DAILY FREIGHT RATES, TEN YEARS ENDING WITH 1904.

	Cents.
Iron ore, head of LakeSuperior to Ohio ports, gross ton	84
Iron ore, Marquette to Ohio ports, gross ton	74
Iron ore, Escanaba to Ohio ports, gross ton	62
Soft coal, Ohio ports to Milwaukee, net ton	45
Soft coal, Ohio ports to Duluth, net ton	35
Hard coal, Buffalo to Chicago, net ton	43
Hard coal, Buffalo to Duluth, net ton	34
Wheat, Chicago to Buffalo, bushel	1.09

AVERAGE OF DAILY LAKE FREIGHT RATES ON HARD COAL FROM BUFFALO TO CHICAGO, MILWAUKEE AND DULUTH DURING TEN YEARS PAST.

Year.	Chicago, cents.	Duluth, cents.
1895	59	24
1896	36	24
1897	29	26
1898	28	23
1899	73	49½
1900	48	39½
1901	50	38
1902	42	33
1903	48	38
1904	43	34
Average for ten years	45½	33

Rate to Milwaukee practically same as to Chicago.
Hard coal is net tons and is handled without charge to vessels.

AVERAGE OF DAILY RATES ON SOFT COAL FROM OHIO PORTS TO CHICAGO, MILWAUKEE, ESCANABA, DULUTH, GREEN BAY AND MANITOWOC.

Year.	Milwaukee, cents.	Escanaba, cents.	Duluth, cents.	Green Bay, cents	Manitowoc, cents.
1894	48½	30	37½	49½	48
1895	54	39	36½	50	51
1896	33½	27	29½	32½	32
1897	28½	20½	26	30	31
1898	28	26½	23	28½	28½
1899	69	58	45½	60½	67
1900	45	40	40	45	43½
1901	49	46	38	48½	48
1902	46½	41½	34½	46½	42
1903	50½	45	41½	50½	46
1904	47	40	37	45½	47
Av. for ten years.	45	39½	35	44	43½

Chicago rate about the same as Milwaukee.
Coal of all kinds shipped in net tons and handled without charge to vessel.

AVERAGE FREIGHT RATES ON IRON ORE PER GROSS TON, FROM PORTS NAMED TO OHIO PORTS—TABLE COVERING WILD AND CONTRACT RATES FOR TWENTY YEARS PAST.

	Escanaba.		Marquette.		Ashland and other ports at the head of Lake Superior.	
Year.	Wild or daily rate	Contract rate.	Wild or daily rate.	Contract rate.	Wild or daily rate	Contract rate
1885	.78	.90	.98	1.05	1.25	1.15
1886	1.28	1.05	1.51	1.20	1.78	1.20
1887	1.59	1.40	1.87	1.63	2.23	2.00
1888	1.05	.90	1.30	1.15	1.43	1.25
1889	1.01	1.00	1.19	1.10	1.34	1.25
1890	.89	1.10	1.07	1.25	1.17	1.35
1891	.84	.65	1.02	.90	1.11	1.00
1892	.74	1.00	.98	1.15	1.15	1.25
1893	.56	.85	.71	1.00	.77	1.00
1894	.47	.60	.60	.80	.78	.80
1895	.73	.55	.92	.75	1.13	.80
1896	.52	.70	.66	.95	.77	1.05
1897	.45	.45	.55	.65	.57	.70
1898	.51	.45	.60	.60	.62	.60
1899	.95	.50	1.08½	.60	1.29½	.60
1900	.60½	1.00	.78	1.10	.84½	1.25
1901	.64	.60	.79	.70	.89	.80
1902	.59	.60	.66	.70	.77	.75
1903	.61	.65	.72	.75	.81	.85
1904	.53½	.55	.62	.60	.70	.70

Charge to vessels in 1904 for unloading iron ore was 19 cents per ton. The wooden vessels that required trimming paid an additional charge of about 3 cents per ton for that service.

Average ore rates for the entire period of twenty years Escanaba, contract 77½ cents, wild 77 cents; Marquette, contract 93 cents, wild 93 cents; Ashland and other ports at head of Lake Superior, contract $1.03 cents wild $1.07. Average for past ten years; Escanaba, contract 60½ cents, wild 62 cents; Marquette, contracts 74 cents, wild 74 cents; Ashland and other ports at the head of Lake Superior, contract 81 cents, wild 84 cents.

RANGE OF LAKE FREIGHT RATES ON WHEAT FROM DULUTH TO BUFFALO.

Year.	Rate, cents.	Year.	Rate, cents.
1904	1.81	1894	1¼@3
1903	1.6	1893	1¼@3½
1902	1.9	1892	2¼@4
1901	2.3	1891	1¾@3½
1900	2.0	1890	2 @5
1899	3.6	1889	2 @5
1898	1.8	1888	2 @5
1897	1.75	1887	2 @8
1896	2.12	1886	3¼@8
1895	3.50		

Figures for ten years past represent average of daily rates for full season, previous to 1895 the rates are highest and lowest in the different seasons.

AVERAGE RATES ON WHEAT PER BUSHEL FROM CHICAGO TO BUFFALO.

Year.	Rate, cents.	Year.	Rate, cents.	Year.	Rate, cents.
1860	9.89	1874	4.03	1888	2.56
1861	11.53	1875	3.42	1889	2.51
1862	10.49	1876	2.90	1890	1.96
1863	7.51	1877	3.72	1891	2.38
1864	9.58	1878	3.07	1892	2.19
1865	9.78	1879	4.74	1893	1.66
1866	12.34	1880	5.76	1894	1.27
1867	6.67	1881	3.44	1895	1.97
1868	7.14	1882	2.50	1896	1.70
1869	6.81	1883	3.41	1897	1.56
1870	5.88	1884	2.18	1898	1.53
1871	7.62	1885	2.02	1899	2.71
1872	11.46	1886	3.68	1900	1.79
1873	7.62	1887	4.13	1901	1.42
				1902	1.51
Average forty-five years, 4.54 cents				1903	1.41
				1904	1.32

Charges to vessels for shoveling, trimming and tallying weights of grain amounted to $4.12½ per 1,000 bushels in 1901.

VESSEL CONGESTION AT BUFFALO

Buffalo, Dec. 20.—This port has had a decidedly sorry season in many respects and can find consolation only in the reflection that it has been fully shared by most of the other ports. Still it has practically all been on account of the poor grain crops and this being the chief grain-handling port on the lakes it has suffered heavily in that respect. Still the end of the season finds the harbor so full of wheat-laden vessels that every marine man here from the harbor master to the last scooper is crazy over the problem of getting the fleet ready for winter quarters and then of getting it into its quarters.

Such a state of things as has existed practically all the month cannot be described. It would be most interesting to know how many miles have been traveled and how many telephone messages have been sent to assist in straightening out the endless tangles that have been with us from the time the first craft was ready to tie up for the winter. They take place now about every time a big steamer tries to stir. Buffalo harbor has about as much elbow room as any of them and is infinitely ahead of such ports as Chicago, but it is learning some new lessons in regard to the 400-footers for all that, mostly on account of the number of them coming in with wheat that must wait with cargoes in till it is too late to leave for any other port.

There have been more vessels wintering here than now, but probably never so many lineal feet of them and it is found that there are plenty of places where it would be easier to handle half a dozen 200-ft. vessels than one of 400 ft. It looks now as though the end of the struggle would see the inner harbor studded on both sides with continuous lines of long steamers and not a few taken care of at the steel plant and other more or less outside points that are considered safe. As to the smaller lumber barges they have been largely driven to Tonawanda for any sort of winter dock that could be called desirable and the owners of good dockage here are mourning —some of them—because they did not double on their rates.

All of which goes to show that this port must do something and that soon to hold its business. It is well enough adapted naturally to the new state of things, but there must be some assistance lent to nature for all that. The task is not going to be an easy one, for this port has always taken such matters pretty easy and waited for government to make the outlay. Other ports have done the same thing and have suffered for it, Chicago notably, and it is time to stir up the authorities before it is too late here also.

There is at least some prospect of a start next season. The new Ohio street bridge will open Buffalo creek some distance further to large craft and the projected Niagara ship canal will extend the harbor northward indefinitely some day. It is now so entirely settled that the bigger the boat the bigger the profit that the small boat must go mostly into the minor branches of the business to stay at all. So there must be room made for the big ones and that right away. The old winding places, that used to be all-sufficient, look like now mostly mere puddles for boys to sail their toy boats in and a revolution is demanded in port to meet the revolution already in force afloat.

It is always the terminal that drags behind in the transportation business. But for that side of their problem the railroads would be able to solve it, for they could run more trains easily enough when once out in the open, but how to get a train, that must be broken up more or less, through the congested points is becoming less and less possible every year, for the traffic grows rapidly and the terminals do not grow at all. Let the lake ports take warning from the predicament of the roads and go to work at once.

And Buffalo is in need of more elevators. Of all things this would have been considered the least likely, even as lately as half a dozen years ago. Now the report is that the grain trade had to stop buying northwestern wheat sometime before the end of the season because it was seen that no storage room could be had for any more. It is a little too bad that the old Buffalo elevator owner was merely a warehouseman, not caring to be even a grain shipper and usually so jealous of his neighbor owner that concerted ownership was impossible and the merest joint-handling arrangement was always secured at the hardest. The ore interests, when they began to be large here, showed a very different grasp of things and went in together on so comprehensive a scale that it was easy to prepare for all handling contingencies.

The elevators are mostly single in interest as yet and the problem of providing for the new demand on them is untouched.

JOHN CHAMBERLIN.

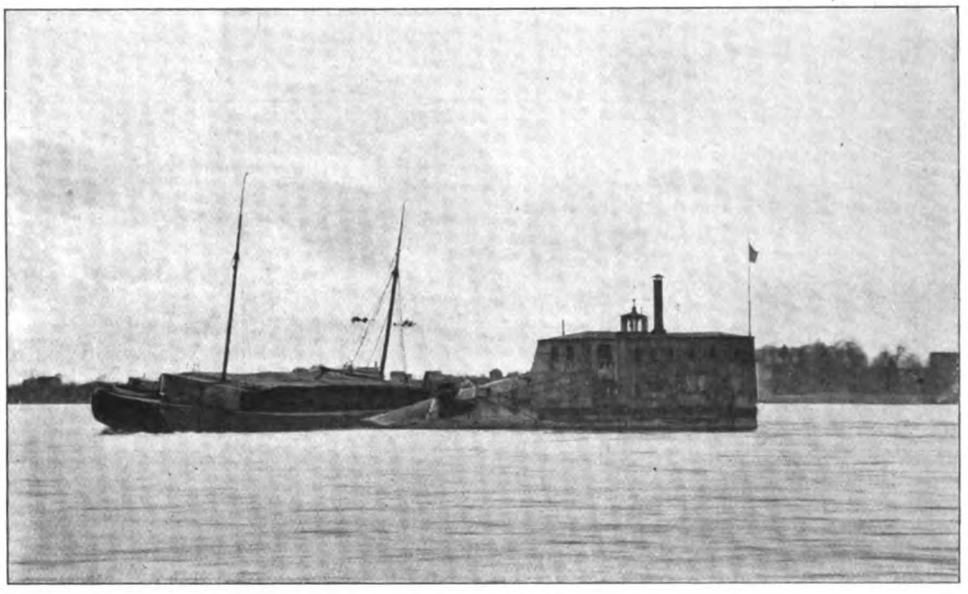
If the newspapers are to be believed, the four keepers of Stannard lighthouse, Lake Superior, had a taste of the privations which mark the extraordinary experience of the Indian woman Angelique at Isle Royal in the winter of 1845. For two weeks past their stock of provisions consisted of beans, potatoes and flour, with very little of the latter. The supply of fuel was very low and was barely sufficient to keep the fog horn whistle going to warn passing vessels. The keepers Ed. Chambers, Frank Marshall, Herbert Crittenden and Keeper Garrity slept in the boiler house, their sleeping quarters being untenable on account of the intense cold. Not having received word that they would be expected to serve three weeks longer than usual and not having been visited by the lighthouse tender Marigold since the middle of October, the keepers became desperate and were about to make the attempt to reach land in their small sail boat when a tug arrived from Marquette to take them home. This is the second instance in which keepers of lighthouses have fallen short of provisions this season.

The Oliver Iron Mining Co. of Duluth have placed an order for the purchase of seven new switch engines. This in connection with a purchase of eight steam shovels for delivery next spring will be used in large part for mine stripping. The Steel Corporation has found it necessary to strip properties that were heretofore considered too deep for steam shovel and milling operations.

The anchorage of a fleet of forty steel steamers off Presque Isle Bay, Lake Erie, has been changed by order of the board of health of Erie, as it is feared that they were endangering the flow of water into the city intake.

NEWPORT NEWS, TWO; NEW YORK SHIP, ONE

Bids were opened in Washington last week for the construction of the battleship New Hampshire and the armored cruisers North Carolina and Montana. Contracts for the construction of the two cruisers were awarded to the Newport News Ship Building & Dry Dock Co., Newport News, Va. and for the battleship to the New York Ship Building Co., Camden, N. J. The Newport News company was the lowest bidder on all three vessels but under the act authorizing them no more than two could be awarded to any one company. The Newport News Co.'s bid for the two cruisers was $3,575,000 each or for one cruiser and the battleship $3,650,000 each, or for one cruiser alone $3,725,000. The New York Ship Building Co.'s bid for the battleship was $3,748,000. The other bids in detail were as follows:



WRECK OF THE MASSASOIT.

Maryland Steel Co., Baltimore, Md., battleship in 42 months, at $4,285,000; one armored cruiser in 42 months, $4,325,000; two cruisers in 42 months, at $4,290,000 each.

The Fore River Ship Building Co., Quincy, Mass., battleship in 42 months, $3,901,000; one armored cruiser, time omitted, $4,231,000; one armored cruiser, according to the company's modified specifications, in 42 months, $4,331,000; both armored cruisers, 42 months, at $4,244,000 each.

Moran Brothers, Seattle, Wash., battleship, 42 months $4,140,000; one armored cruiser, 42 months, $4,387,000; both cruisers, one 42 months, the other 50 months, at $8,336,000 for both.

Wm. Cramp & Sons, Philadelphia, Pa., battleship in 41 months, $3,889,000; one cruiser, 41 months, $4,080,000; both cruisers, one in 40 months and the other in 41 months, $3,879,000 each.

The New York Ship Building Co. of Camden, N. J., one cruiser, 38 months, $3,850,000, one in 38 months and the other in 40 months, $3,735,000 each. Battleship in 38 months, $3,748,000.

The Union Iron Works, San Francisco, one cruiser in 42 months, $3,800,000; or two in 42 months, $7,590,000 for both.

The New Hampshire will be of 16,000 tons displacement and the North Carolina and Montana, 14,500 tons each.

WRECK OF THE MASSASOIT

The schooner Massasoit which for several weeks has rested on the nose of the Buffalo waterworks intake in Niagara river has proved to be one of the ugliest wrecking jobs of the year. Many efforts have been made to release her without avail and it is probable now that she will have to be dynamited. This in itself is ticklish work as extraordinary care would have to be made not to damage the intake itself. Five of the most powerful tugs of the Great Lakes Towing Co., the Babcock, Gee, Conneaut, Constitution and Maytham with several heavy hawsers endeavored to pull the boat off the intake but without success. The Massasoit's cargo was of lumber which owing to the severity of the weather and the water-logged condition of the boat was an especially disagreeable one to remove. In fact Capt. Perew, who has the work of lightering the vessel, found himself with a strike on his hands when he declined to pay the lumber shovelers $1 per hour for working upon the cargo. Meanwhile the city of Buffalo is much concerned regarding the safety of its intake and the commissioner of public works has given wreckers only a short time more to get her off. The Massasoit was owned by Capt. John Boland but has been abandoned by him to the underwriters.

The steamer Curry, owned by H. A. Hawgood of Cleveland will be lengthened 72 ft. by the American Ship Building Co. this winter. The Curry is now 380 ft. over all, 360 ft. keel and the addition will make her 452 ft. over all and 432 ft. keel. The carrying capacity will be increased about 1,600 tons thereby. The Curry was built by F. W. Wheeler, Bay City, in 1893 and when she came out was the largest boat on the lakes. Her engines were placed amidships because it was thought that in a ship so long it would be unsafe to put them astern. The Curry will be placed in No. 2 dry dock in Cleveland in about two weeks.

Considerable anxiety is felt at Sault Ste. Marie concerning the safety of W. O. Demers, lighthouse keeper at Caribou Island, and Fred Pelletier, his helper, who were to have been brought in by the tug Reid last week. The Reid called at Caribou Island but was unable to land owing to the seas. She blew her whistle for a long time to attract the attention of the light keepers but no one responded. It was supposed that Demers and his assistant had left for the mainland in their sail boat, but as nothing has been heard from them an expedition has gone in search of them again.

Three men were killed and four dreadfully scalded in the engine room of the battleship Massachusetts last week. Without warning the gasket between the boiler plate and the boiler head gave way and a terrific rush of steam occurred. The doors of the fire room were closed at the time of the accident and the only avenue of escape was a safety ladder.

It is understood the negotiations for the consolidation of the Jenks Ship Building Co. and the Dumford Dry Dock Co. have been closed. The Jenks Ship Building Co. will move its plant from Black river to the site occupied by the dry dock company in St. Clair river.

A revision in colors of the chart of Agate Harbor has just been issued by the United States lake survey office and is for sale by the Marine Review.

CHANGES IN STEAMBOAT INSPECTION RULES

A number of important changes in the rules and regulations of the board of supervising inspectors of the steamboat inspection service have been approved by Secretary Metcalf of the department of commerce and labor. These changes are the result of the recent protracted meeting of the board of supervising inspectors of the service, which followed soon after the Gen. Slocum disaster at New York, in which nearly 1,000 lives were lost. The changes noted are alike of interest to the steamboat service and to the general public, and are as follows:

RULE III—BOATS, RAFTS, BULKHEADS AND LIFE SAVING APPLIANCES.

Provides for details of construction of metallic lifeboats and life rafts, and the filing by makers thereof of drawings and specifications with the board of supervising inspectors.

Requires metal air tanks in wooden lifeboats.

Small increase of required boat capacity on river passenger steamers.

Rearrangement, without substantial change, of tables for lifeboat capacity.

Prohibition of the use of loose or compressed granulated cork in the manufacture of life rafts or life preservers.

Prohibition of the use of Kapok life preservers.

Additional details as to the method of placing straps on life preservers, and as to the quality of the covers thereof and the method in which the same shall be sewed and constructed.

Life preservers must be suspended on wooden slats or cotton cords, and not on wire, and at a height of not more than 7 ft. from the deck surface below.

Requirement of one life preserver for every passenger and member of the crew on all vessels.

Requirement of hand pumps, fire hose, boats and rails on barges carrying passengers.

Additional water tight bulkheads required on larger vessels. Additional details as to construction of such bulkheads.

RULE IV—FIRE APPARATUS.

Requires all passenger steamers to be provided with fire buckets, barrels and axes, instead of on inland steamers only as before.

Requirement of steam fire branches in lamp lockers, oil-rooms and light compartments, which compartments must also be lined with metal.

Requires that steam fire pumps shall be capable of throwing an "effective stream of water for a distance of not less than 50 ft. through at least two fire connections, each on the main deck and each deck above the main deck."

"Every such pump shall be fitted with a gauge and a relief valve adjusted to lift 100 pounds pressure," which takes the place of a pro rata table of different sizes of pumps for steamers of different tonnage.

Requirement for portable fire extinguishers on all passenger steamers proportioned in number to the tonnage of the boat.

RULE V—LICENSED OFFICERS.

Service on steam yacht omitted as part of allowable qualifications for an applicant for license.

The addition of sundry small details of the various kinds of nautical experience which render applicants eligible for examination for license as officers.

Added requirements as to discipline of crew in fire and boat drills.

RULE VIII—EXCURSION STEAMERS.

Fixes number of licensed officers and firemen and requires substantially one additional watchman for every 250 persons carried.

Requires that officers and watchman shall be uniformed.

Requires all excursion barges in tow to carry one master. Also two deck hands for every 250 persons.

Ferryboats engaging in excursions must carry same officers, crew and equipment as required for excursion steamers.

RULE IX—DUTIES OF INSPECTORS.

Reduce the required joint inspection by both hull and boiler inspectors to hydrostatic pressure, pumps, hose and other apparatus.

Requires all hose to be subjected to a pressure of 100 pounds to the square inch and hose coupling securely fastened.

New and important specific requirements as to crew complement and the number of officers and men to be required on given classes of vessels.

RULE X—MISCELLANEOUS.

Requires owner, agent or master of vessel to indicate safe draft of water for vessel.

Omits the load line requirements and table as to depth of hold and free board and conditions thereof when loaded.

Certain changes proposed in rules one and two relating to "boiler plate" and to "boilers and attachments" probably will be announced later.

OBITUARY

Capt. Wm. Sims, 79 years old, died at Alpena last week. He was a well known lake captain and was formerly keeper of the Presque Isle light.

Rear Admiral Ralph Aston died at Brooklyn, New York, last week after an illness of nearly two years. He was born in Middleton, Conn., in 1841 and was appointed as third assistant engineer in 1861. He became chief engineer in 1888 and in 1899 his rank was changed to captain. He was placed on the retired list in January, 1902, upon his own application with the rank of rear admiral. He served creditably throughout the civil war.

Capt. Walter Hunter was found dead in his hotel at Buffalo last week. He had gone into the dining room for breakfast and dropped into a dose. He could not be aroused and died before he could be taken to the hospital. Capt. Hunter was about sixty-two years old and sailed the little Canadian schooner Persia for many years. Later he was for several years connected with various towing companies in Buffalo.

PERSONAL

Mr. Evan I. Jenkins, who has been for the past two years second vice-president of the Marine Engineers' Beneficial Association with headquarters on the great lakes, has been appointed first vice-president, vice Mr. Edward Bray of Norfolk, Va.

Mr. A. S. Clark has been elected president of the Lackawanna Steel Co. Mr. Clark began life as a workman in the laboratory of the Union Steel Co. in Pittsburg. He had become the general manager of the Illinois Steel Co. and has been more lately associated with the International Harvester Co. and the Deering Harvester Co. His rise to very important positions has been quite rapid as he is now only forty-two years old.

The season of navigation on the great lakes closed with the arrival at Buffalo this week of the big steel propeller B. Lyman Smith owned by the United States Transportation Co. The Smith grounded in St. Clair river but was released without difficulty. The ice crushers Pleasure and Promise broke a passage for her as far as Point Pelee, Lake Erie, where open water was reached. The Raleigh and Tokio, loaded with ore, were also to have come to Lake Erie but concluded to winter at Detroit.

The steamer Wahcondah, laden with salt for Kingston, was the last vessel to pass through the Welland canal this season.

LIVERPOOL SHIPPING LETTER

Liverpool, Dec. 12.—Mr. James Boyle, the United States consul at Liverpool, has prepared a very interesting report for his government dealing with Liverpool and its shipping. During the past year, Mr. Boyle says, Liverpool has held her own as the premier port of the world in trade with the United States, both in imports and exports, although there has been a decrease of declared exports at the Liverpool consulate. No continental port at all approximates Liverpool in American trade, and the preponderance of Liverpool over competing British ports in trade with the United States is little appreciated on either side of the Atlantic, for Liverpool has over one-fourth of the total sailings of ships between the United Kingdom and the United States; while as to tonnage, it has almost one-half. And the indications are that this preponderance will go on increasing. The returns of the Mersey Docks and Harbor board show that the total number of vessels paying dock and harbor dues at Liverpool during the year ended June 30, 1904, was 25,400, including coastwise vessels, an increase of 573 over the previous year, and the approximate total net tonnage, inward and outward, on which dues are charged, was 31,252,482 tons, an increase of 2,176,989 tons over the previous year. A peculiarity of the development of shipping at Liverpool is that the tonnage of vessels is all the time increasing, and this to a greater degree than is noticeable at other ports. This peculiarity is more especially marked in the North Atlantic trade. Liverpool is the home port of the three largest vessels in the world—the Baltic, the Cedric, and the Celtic, of which the tonnage are respectively 23,875, 21,034 and 20,904 tons. These three boats belong to the White Star, and there is at Belfast, in a partially completed state, the Adriatic, a sister ship to the Baltic and of the same dimensions, intended for the White Star Line. Besides, to the credit of Liverpool must be placed the two big Cunard turbine boats, which are not only to be the fastest, but the largest vessels in the world and will, it is expected, achieve 25 knots, although 24½ knots is the contract maximum power. Probably the great public interest in these two boats consists not so much in the fact that they are to be the fastest and largest afloat, but that their propulsive power is to be by turbines, of which each of the boats will be equipped with four. The Cunard company will also soon have ready the Caronia, of 21,000 tons gross, which is being built under the requirements of the British admiralty as an armed cruiser, she being fitted for twelve large quick-firing guns. A sister boat to the Caronia, the Carmania, is besides being built for the Cunard company, but she will be a triple-screw turbine. The Carmania, however, while being a pioneer of the kind in the New York trade, will not be the first turbine boat in the regular Atlantic service. That honor will be held by the Allan Line, running from Liverpool to Canadian ports. In a few weeks' time the Allan Line will have its turbine boat, the Victorian, running, and the Virginian, a sister turbine ship, will be on the berth a month or two later. Nearly all the new boats for cross-channel and short sea service here, in addition, are being supplied with turbines. Recently one built for the Isle-of-Man service showed 23 knots an hour in her trial trips.

Dealing with the improvement of Liverpool's sea approaches, Mr. Boyle is evidently of the opinion that Liverpool has made the most of its opportunities in this direction. One of the most interesting features of the activities of Liverpool as a seaport is that relating to dredging. It is believed that New York and Liverpool have the most powerful dredges at work of any ports. Liverpool, it is said, originally got the idea of its system of dredging from the United States and improved upon it. During the past ten years 16 ft. or more of the sandy obstructive bar has been removed by dredging, and in carrying out these operations 80,000,000 tons of sand have been removed. The result is that a minimum depth of 27 ft. at low water in spring tides has been secured for the navigation of the bar and throughout the entire distance up to the Liverpool landing stage, alongside of which the largest steamers in the world, such as the Baltic of 24,000 tons, are able to lie at all stages of the tide. The Mersey Dock board have now under way enlargements and improvements of docks, with the object of maintaining the port fully capable of receiving conveniently steamers of the largest size. Already the expenditure authorized by the board in connection with these schemes aggregate about $11,750,000.

The report of the superintendent of foreign mails for the year ending June 30, 1904, issued by the Washington government printing office, contains an amount of valuable information relating to the United States mails and their transport. The time hereunder shown includes the time occupied by the mails from leaving the postoffice at New York until their arrival at the London or Paris postoffices. The record to London lies with the Hamburg-American liner Deutschland, with an average of 150.5 hours on a total of seven trips. The ship's quickest trip was 140.8 hours. The next best record is that of the North German Lloyd steamer Kaiser Wilhelm II., which for eleven trips averaged 151.8 hours performing the same service, 146.8 hours being the ship's record for the year under review. The third on the list is the Kaiser Wilhelm der Grosse, which for twelve trips averaged 152.3 hours, her record trip for the period being 148.4 hours. Next in order is the same company's ship, Kronprintz Wilhelm, which made eleven trips, and averaged 154 hours, making her year's record in 148.9 hours. The Cunard company's Campania follows with eleven trips, the average time occupied in delivering her mails via Queenstown at London postoffice being 168.1 hours, her record time for the year being 164.4 hours. Then follows her sister ship, the Lucania, with twelve trips and an average of 170.7 hours, but with a record trip for the year of 163.6 hours. The Etruria and Umbria each have thirteen trips to their account, the former averaging 188.9 hours and the latter 191.4 hours, with record trips for the year of 180.7 and 184.0 hours respectively. The Oceanic of the White Star Line also made thirteen trips, delivering her mails by the same route in the average time of 171.8 hours, with the quickest trip of 167.6 hours. The Majestic's average time on her twelve trips is placed at 184.5 hours, and the Teutonic's eleven trips at 189.0 hours, with quickest trips of 176.8 hours and 183.2 hours respectively. The American liner St. Louis made thirteen trips, showing an average time of 173.4 hours, with 167.9 hours as the quickest; the Philadelphia making a similar number of trips and averaging 179.4 hours, with a quickest trip of 171.7 hours. From the above it will be seen that the German lines deliver the American mails via Southampton by four steamers in less time than is occupied by the two crack Cunarders. Much has been said in America about the unfairness of the mail subsidies paid to British steamship companies by the British government, and these have been quoted as operating prejudicially against American owned ships. The report before mentioned shows that the International Mercantile Marine Co.'s vessels under American registry received for the postal service $699,554.88, that the same company's White Star fleet is credited with $194,048.03, in fact, the company for its transatlantic mail service obtained $885,947.15. This compares with $151,251.54 received by the Cunard company, which includes $180.58 for the Boston mail service. The North German Lloyd Co. got $169,607.15, and the General Transatlantic Co. (to France direct) secured $45,695.28. The total grants for foreign mail service amounted to $1,287,413.15, of which the International Mercantile Marine Co. received $885,947.15, or nearly 70 per cent of the whole. Considering the speed of the various lines, it will

be seen that the New York correspondent of a London daily journal has been very wide of the mark in his assertions.

The last launch of the year in Belfast has just taken place from Messrs. Workman & Clark's yard, the vessel being the steamer Regina, built for a Havana firm engaged in the molasses trade with the West Indies. She is built on the tank principle, and will carry cargo in bulk. During the present month four large steamers undergoing repairs at Queen's Island will leave Belfast. These include the American liner St. Louis and the White Star liner Germania, now the Dominion liner Ottawa. On the Tyne I learn that the number of vessels launched during November was thirteen, of a tonnage of 13,552 tons. The number of vessels laid up in the port at the end of November was thirty-two steamers and one sailing ship of a total of 46,000 tons. From Glasgow it is reported that the two 35,000 ton displacement intermediate 17-knot steamers for the Hamburg-American Line, are to have passenger hoists as well as companion-ways leading from the lower decks to the promenades.

The Merchant Service Guild, which represents nearly 10,000 British shipmasters and officers, has lately been engaged in drawing the attention of the British foreign office to further serious complaints regarding crimping at United States ports. Lord Lansdowne, the British foreign minister, in reply to these representations, forwards to the guild information showing that the Mississippi vagrancy law had proved efficacious in suppressing crimping in that state. His lordship, however, wished once more to impress upon the guild that the masters of the merchant vessels must take the initiative in laying complaints before the United States authorities if it was desired to prevent a recrudescence of the evil.

An official publication just issued by the Bristol Docks committee shows, for the information of shippers and traders, that there is a perfect network of navigable rivers and canals radiating from Bristol. They extend east as far as London, away south touching sundry coast places, and far into the Midlands. Bristol thinks that more ought to be done than at present in transporting goods by water from one part of the country to another. Traders of the port are not alone in this view. Their representatives on the Chamber of Commerce are pressing for legislation which may give greater facilities for inland navigation, and they are securing support for the scheme from far and near.

THE SLOCUM DISASTER

Editor Marine Review: Since the Slocum disaster hundreds of sensational newspaper articles have been published, many of which do not contain a single true statement regarding the affair except that the disaster did actually occur. It is very much to be regretted that through these accounts the general public should be so completely misinformed. The facts concerning this most deplorable occurrence should be sufficiently horrifying to satisfy the most ravenous inventors of sensational fiction.

Many of these statements are contained in newspaper clippings accompanying letters and samples of devices from inventors of life-preservers, forwarded to the board of supervising inspectors, while in session at Washington, no doubt with good intentions and many such devices have merit, but the inventor is often led astray by these sensational accounts and is led to produce an inferior or exaggerated article in consequence. One of these clippings announced that many of the victims of the Slocum disaster were found anchored to the bottom with life preservers containing large bars of iron, when in fact not a body was found drowned that had a life preserver on at all of any kind. While there is no punishment too severe for those guilty of putting iron in these compressed cork life preservers in order to bring them up to the required weight of 6 pounds each, the fact still remains that by reason of a panic such as always occurs at such times that life preservers that were good and available were not brought into use to any great extent. The United States rule demands nearly two-fifths more buoyancy for life preservers than the English rule. Our margin of safety therefore exceeds the English rule and also the rules adopted by any other country in this regard. This article is not intended to in any way exonerate any one who is found direlict in his duties as an inspector or officer of a steamer, but simply that the public may guard against forming erroneous opinions upon a subject regarding which the public should be undeceived. The people are better prepared and equipped to fortify themselves against the recurrence of a disaster or an evil, by being in possession of the actual facts than by any untruthful or exaggerated accounts, sent broadcast over the country, productive of no good but of infinite evil.

Cleveland, Dec. 20. JAMES STONE.

THE DREDGER MEXICO

The British dredger Mexico is undergoing extensive repairs at the Risdon Iron Works, San Francisco. She was built in 1886 on the Clyde specially for submarine dredging and has proved perfectly successful. Her two 20-in. suction pipes, one on each side, draw up about 2,500 tons of sand an hour. This is deposited in the great hold of the vessel; the pumping engines are stopped, the pipes and anchors hoisted and the vessel driven out to sea by the propelling engines. The tank is opened and the sand drops down to the bottom of the ocean. The doors of the tank close so quickly that very little water gets in and the dredge returns to her work.

The vessel is anchored bow and stern, the pipes are lowered, the pumping engines started and the great fans that create the vacuum begin to revolve. The heavy machinery does its work smoothly and unerringly. The irresistible force of the centrifugal pumps brings up from the bed of the sea many rare shells and other curiosities. When the Mexico was at work, as she was for seven years continuously, in the harbor of Vera Cruz, she anchored over a spot where a pirate ship lay submerged. Swords, spearheads, muskets and coins were brought to the surface. Several thousand dollars' worth of gold and silver coins were gathered. On another occasion a small iron casket containing jewels was brought up. Many cannon balls which had been fired at the American ships by the shore batteries were pumped up in the harbor of Vera Cruz and were presented to the historical museum there.

The dredger is under contract with the Mexican government to deepen certain harbors, and, after finishing its work on the Pacific, will return to the Atlantic coast of the republic.

A favorable report has been made on Representative Bede's bill providing an appropriation of $150,000 for the construction of a lighthouse at the Rock of Ages, Isle Royal.

An armored cruiser squadron is one of the new commands which the navy department will establish within the next six months. This squadron will be composed of the armored cruisers West Virginia, Virginia, Maryland and Colorado.

Orders have been received at Halifax by cable from the British admiralty directing that the naval yard at Halifax be closed. This order appears to be in keeping with Sir John Fisher's plan for the reorganization of British naval methods and for the establishment of a huge and powerful flying squadron instead of a fleet permanently stationed at Halifax and Bermuda. The naval dock yard at Halifax has been in existence for 150 years. If it is considered permanently abandoned by the admiralty the Dominion government will make an endeavor to acquire it for the Intercolonial railway.

The Stoddard Mfg. Co., Rutland, Vt., is planning to begin the manufacture of gasoline launches about Jan. 1.

TRADE NOTES

The engines of the Anchor Line steamer Juniata, launched at the Cleveland yard of the American Ship Building Co. this week, are fitted with National Lead Co. Phoenix metal.

The Derry-Collard Co., 256 Broadway, New York, has just issued an encyclopedia engraving showing every part in detail, both inside and out, of a modern battleship with all the parts numbered and indexed. It is a masterpiece of painstaking, careful draftsmanship and graphically portrays the immense amount of machinery, guns and fittings which enter into the make-up of a first-class modern fighting vessel. As an illustration of what a battleship really is it is far more illuminating than any description could be. The engraving will be mailed in a heavy tube to anyone for fifty cents.

The George F. Blake Manufacturing Co. has just published a new edition of their general catalogue, the 150 pages of which describe and illustrate steam pumps for every possible service, including boiler feeders, auxiliary apparatus for steamships, mining pumps, sugar house machinery, water-works pumping engines, vacuum pumps, air pumps and condensers, artesian pumps, brewery and distillery pumps, high pressure pumps, acid pumps, etc. This company states that it has recently added to its plant an entirely new machine shop and foundry, equipped with the most modern tools. The catalogue will be sent upon request.

The Northern Engineering Works of Detroit, Mich., has just put out booklet No. 19 which shows in condensed form a few of the many types of cranes which they manufacture. The booklet consists of twenty-eight pages, pocket size, and is illustrated with about twenty-six cuts of cranes. The booklet is to be regarded, however, as merely an index to the larger catalogues. The cranes manufactured by this company are of high standard of design and workmanship. As cranes are the specialty of this company all sorts of cranes are manufactured by it and it would be well for any one interested in the subject to ask for the book.

Underwriter fire pumps are described in Bulletin W-114 recently issued by Henry R. Worthington, 114 Liberty street, New York. These pumps are designed to meet the specifications of the insurance companies and are fitted with air and vacuum chambers, relief valves, pressure gauges and other special devices required. All rubbing parts are of composition metal to prevent rusting and sticking, and the pumps differ considerably from ordinary trade pumps. The back cover of the pamphlet shows the fourteen Worthington fire pumps supplied to the Louisiana purchase exposition for the protection of the buildings at St. Louis.

The Morse Monitor nozzle which was first introduced in 1881 is a well tested medium for handling streams from 1½ in. to 5½ in. diameter and is one of the most popular of all devices of this character. In the Morse monitor nozzle the waterway is full size and gives equal volume at all angles. There is no dividing the stream or turning it at right angles before reaching the discharge pipe as exists in some devices which create extra pressure on the pumps with an increase of stream. The range of stream is from perpendicular to 10° below horizontal and as the chamber rotates completely on the base any desired spot can be reached. The stream once directed will not deviate under pressure and requires no further attention. The accompanying illustration shows one of the Morse monitor nozzles on a Pennsylvania railroad tug. The nozzle is manufactured by Andrew J. Morse & Son, 140 Congress street, Boston, Mass.

The simplicity of the handsome new office building of the B. F. Sturtevant Co. at Hyde Park, Mass., brings it into harmony with the shop buildings and still it bears the appearance and grandeur of a modern school-house. It is about 45 ft. wide and 125 ft. long, with four stories and a basement. One-half of the basement is occupied by the printing plant and its stock room. Here are printed the catalogues, circulars, letter-heads and all printed forms used in the office and shops. Another portion is used as a lunch room for the office force, while the heating and ventilating apparatus is also located in the basement. Naturally the building is heated and ventilated by the Sturtevant fan system. The galvanized iron heat flues are built into the walls and convey the heated fresh air through register openings into the various rooms. On the first floor are located the production, time and cost departments and the publication department; on the second floor are the sales and accounting departments, cashier, clerks, etc., the manager's office and the filing department. The drafting rooms occupy the whole of the third floor while the blue print department is on the fourth floor. The fourth floor also contains two large vacant rooms which may be utilized for future growth, either as offices or drafting rooms. Eight large fire-proof vaults, each about 9 ft. wide and 19 ft. long give abundant room for the safe keeping of books, correspondence, drawings and valuable data. The first two floors are finished in quartered oak and the upper two in plain oak. The wainscoting, painting, the tinting of the walls and ceilings and the office fixtures are all very tasty and add much in making this office building one of the finest in the country.

COAST SHIP YARDS

The steam schooner Sea Foam was successfully launched at Lindstrom's yard, Aberdeen, Wash., recently. She is building for Beadle Bros. and is 132 ft. long, 32 ft. beam and 10 ft. deep.

The steamer Arago recently launched at the yard of the Portland Ship Building Co., Portland, Ore., is now at the yard of the Williamette Iron Works, Portland, Ore., having her machinery installed. The Arago is 89½ ft. long, 18 ft. beam and 9 ft. deep.

The United Engineering Works of San Francisco have contracted with H. I. Crandall & Sons, Boston, for the construction of a marine railway at their ship yard at Alameda. The dock is to be capable of handling a vessel 350 ft. long and 50 ft. beam.

AROUND THE GREAT LAKES

The annual meeting of the Lake Carriers' Association will be held in Detroit, beginning Jan. 12.

The 500-ft. freighter building for Mr. G. A. Tomlinson at the Lorain yard of the American Ship Building Co. was launched today, Thursday.

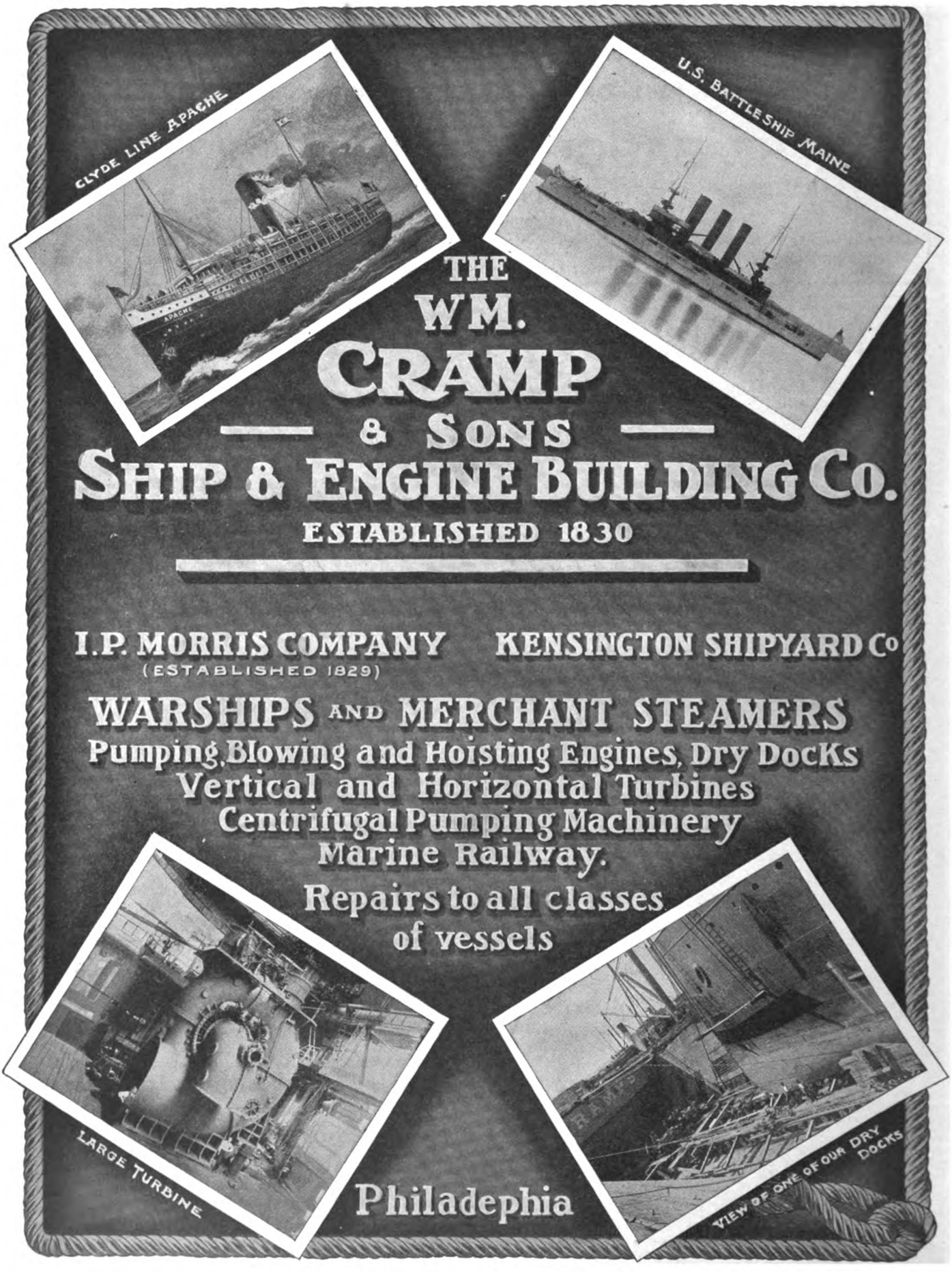
A number of steamers are congregated at the West Superior yard of the American Ship Building Co. awaiting repairs. Work is progressing well upon the new boat building there and an unusually busy winter will be put in.

Mr. C. F. Bielman, who has the contract for delivering the mails to passing vessels at Detroit, will build a new boat for this service to go into commission next season. The present mail tug, Florence B., was recently in collision with the steamer Spokane and was more severely damaged than was at first believed.

The Lake Erie Transportation Co., commonly known as the Wabash Railway Line, has given a contract to the Craig Ship Building Co., Toledo, for an 8,000-ton package freight and grain carrier to replace the old steamers Gault and Sage on the Toledo and Buffalo route. These two old steamers will probably be sold.

The old steamer John Kelderhouse, which was built at Bay City in 1857, has been successfully released from North Point and taken to Detroit. It was thought at first that the old schooner would certainly be totally destroyed, but her timbers are sound and she withstood the pounding of the waves well during the wrecking operations. She was taken to Detroit by the tugs Manistique and Salvor.

VOL. XXX. CLEVELAND, O., DECEMBER 22, 1904. No. 25.



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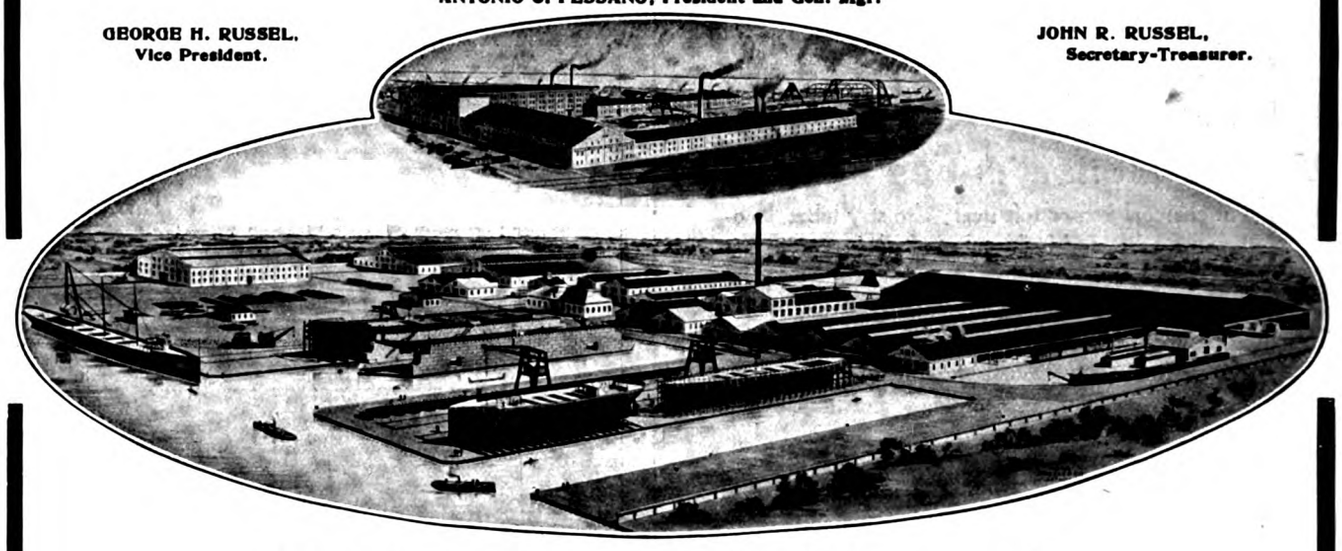

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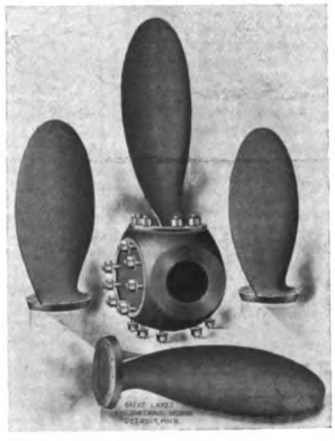

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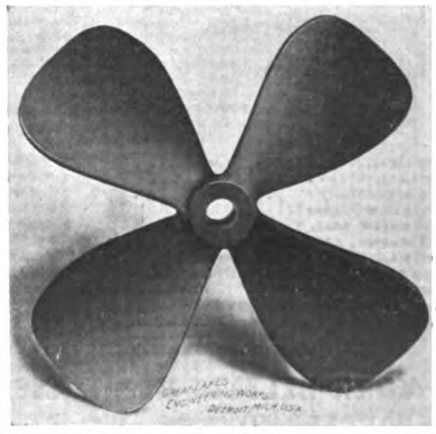

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New submarine drill boat for sale. Hull 72 ft. by 24 ft., 5 ft. sides. Enquire of Hickler Bros., Sault Ste. Marie, Mich. tf

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Also one 8 H. P. marine engine, $50.

Address I. Applebaum, 38 Randolph St., Detroit, Mich. tf

PROPOSALS for Barges and Boats. U S. Engineer Office, Custom House St Louis, Mo., Dec. 5, 1904. Sealed proposals, in triplicate, for furnishing Wooden Flat Barges, and Wooden or Steel Flat B ats, will be received here until 12 M Jan. 4, 1905, and then publicly ope ed. Information furnished on application. THOS. L. CASEY, Major, Engrs. Dec 29

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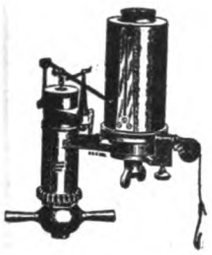

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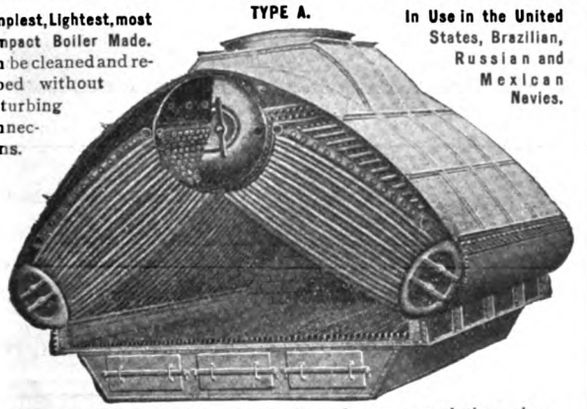

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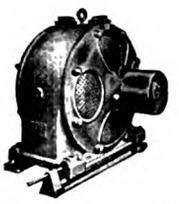

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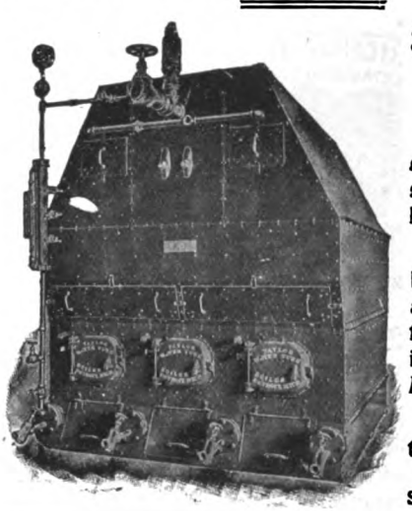

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See accompanying index of Advertisers for full addresses of concerns in this directory.

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Dake Engine Co.....Grand Haven, Mich.
Great Lakes Engineering Works.....Detroit.
Mietz, Aug. .....New York.

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Marine Mfg. & Supply Co.....New York.

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Great Lakes Engineering Works.....Detroit.

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Seaboard Steel Casting Co.....Chester, Pa.

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Holzapfel's American Composition Co..New York.

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Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F., Co..... Hyde Park, Mass.

ASH EJECTORS.
Great Lakes Engineering Works.....Detroit.

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New York Belting & Packing Co....New York.

BLOCKS, SHEAVES, ETC.
Boston & Lockport Block Co....Boston, Mass.
Cleveland Block Co.....Cleveland.

BLOWERS.
Sturtevant, B. F. Co. .....Hyde Park, Mass.

BOAT BUILDERS.
Dram, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, David.....New York.
Lane & DeGroot ....Long Island City, N. Y.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co....St. Joseph, Mich.
Willard, Chas. P. & Co.....Chicago.

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Dearborn Drug & Chemical Works....Chicago.

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American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Babcock & Wilcox Co.....New York.
Bertram Engine Works Co., Ltd. .....
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Detroit Ship Building Co.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co ..... Quincy, Mass
Georgian Bay Engineering Works.....
..... Midland, Ont.
Great Lakes Engineering Works.....Detroit.

BOILER MANUFACTURERS—Continued.
Tenks Ship Building Co....Port Huron, Mich.
Kingsford Foundry & Machine Works....
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Marine Iron Works ..... Chicago.
Maryland Steel Co..... Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co....
..... Duluth, Minn.
Roberts Safety Water Tube Boiler Co....
..... New York.
Stirling, The Co.....Chicago.
Superior Ship Building Co....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Willard, Chas. P. & Co.....Chicago.

BOILER RIVETS.
Bourne-Fuller Co..... Cleveland.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.

BOILER TUBES, MARINE.
Reading Iron Co.....Reading, Pa.

BRASS AND BRONZE CASTINGS.
Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lunkenheimer Co. .....Cincinnati.
Macbeth Iron Co.....Cleveland.
Victor Metals Co.....Braintree, Mass.

BRIDGES, BUILDERS OF.
Scherzer Rolling Lift Bridge Co....Chicago.

BUCKETS, ORE AND COAL.
Brown Hoisting & Conveying Machine Co.
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Macbeth Iron Co. .....Cleveland.
McMyler Mfg. Co..... Cleveland.

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Martin-Barriss Co.....Cleveland.

CAPSTANS.
American Ship Windlass Co..Providence, R. I.
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Smooth-On Mfg. Co.....Jersey City, N. J.

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Lebanon Chain Works.....Lebanon, Pa.
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Brown Hoisting Machinery Co. (Inc.)....
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General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

CHAIN HOISTS.
Boston & Lockport Block Co....Boston, Mass.
Dake Engine Co.....Grand Haven, Mich.

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Penton Publishing Co. .....Cleveland.
Potter, J. D.....London.

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Ashton Valve Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

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Atlantic Works .....East Boston, Mass.
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Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
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Newport News Ship Building Co.....
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Shipowners Dry Dock Co.....Chicago.
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Macbeth Iron Co.....Cleveland.

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Standard Gauge Mfg. Co.....Syracuse, N. Y.

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Lunkenheimer Co. .....Cincinnati, O.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

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McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
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Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

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Falls Hollow Staybolt Co...Cuyahoga Falls, O.

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Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

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Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

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Frankfort Marine, A. & P. G. Ins. Co....
..... New York.

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Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Voss, F. D.....New York.

IRON CASTINGS.

Reading Iron Co.....Reading. Pa.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland. O.
Hanna, M. A. & Co.....Cleveland.
Pickands. Mather & Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

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Westinghouse Elec. & Mfg. Co.... Pittsburg, Pa.
Sawyer-Man Electric Co. ..... Pittsburg, Pa.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....
..... Midland, Ont.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

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Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D. .....New York

LIGHTS, SIDE AND SIGNAL.

Russell & Watson .....Buffalo.

LOGS.

Walker & Sons, Thomas ....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.

Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros. .....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works ..Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

METAL POLISH.

Bertram's Oil Polish Co.....Boston

MOTORS, GENERATORS—ELECTRIC.

Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

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NAUTICAL INSTRUMENTS.
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NAUTICAL SCHOOLS.
Chicago Nautical School. ..... Chicago.

NAVAL ARCHITECTS.
Hynd, Alexander .....Cleveland.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons. ..... Chicago.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Sadler, Perkins & Field.....New York.
Wood, W. J.....Chicago.

OAKUM.
DeGrauw, Aymar & Co.....New York.
Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.
Mietz, Aug. .....New York.

OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co...New York.

PACKING TOOL.
Matteson & Drake .....Philadelphia.

PAINTS.
Baker, Howard H. & Co.....Buffalo.
Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
New Jersey Zinc Co.....New York.
Upson-Walton Co. .....Cleveland.

PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PILE DRIVING AND SUBMARINE WORK.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co..
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co.,
..... Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H...Milwaukee.
Sullivan, M. .....Detroit.

PIPE, WROUGHT IRON.
Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.
Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.
Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading Pa.

PNEUMATIC TOOLS.
Allen, John F.....New York.

POLISH FOR METALS.
Bertram's Oil Polish Co.....Boston.

PRESSURE REGULATORS.
Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.
American Ship Building Co.....Cleveland.
Atlantic Works .... East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.. Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Marine Iron Works ..... Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works Detroit.
Marine Iron Works ....Chicago.
Kingsford Foundry & Machine Works....
..... Oswego, N. Y.

PUNCHES, RIVETERS, SHEARS.
Allen, John F. .....New York.

REFRIGERATING APPARATUS.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping..
.....New York.

REPAIRS—ENGINE AND BOILER.
(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works.....
.....Midland, Ont.

RIVETING MACHINES.
Allen, John F.....New York.

RIVETS, STEEL FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.
American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.
See Wrecking Companies.

SCHOOLS—NAVIGATION.
Chicago Nautical School.....Chicago.

SEARCH LIGHTS.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

SHEARS.
See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.
Bourne Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd. Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Roach's Ship Yard .....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.
Baker, Howard H. & Co.. .....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.
Kidd, Joseph..... .....Duluth.
Kreer & Parsons. .....Chicago.
Matteson & Drake..... Buffalo.
Rice & Lovejoy..... Buffalo.
Steel, Nacey & Hynd ..... Cleveland.
Wood, W. J..... Chicago.

SHIP LANTERNS AND LAMPS.
Russell & Watson .....Buffalo.

SHIP TIMBER.
Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.
Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.
Reading Iron Co.....Reading, Pa.

STEAM VESSELS FOR SALE.
Gilchrist & Co., C. P. .....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S..... .....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.
American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co .....Boston.
International Mercantile Marine Co.....
..... Philadelphia.
New York & Cuba Mail S. S. Co.....New York
Red Star Line .....New York.
United Fruit Co .....Boston.

STEEL CASTINGS.
Macbeth Iron Co.....Cleveland.
Otis Steel Co.....Cleveland.

STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Pawling & Harnischfeger .....Milwaukee.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.
Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.
Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

TESTS OF MATERIALS.
Hunt, Robert W. & Co.....Chicago.
Lunkenheimer Co .....Cincinnati, O

TILING, INTERLOCKING RUBBER.
New York Belting & Packing Co...New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Allen, John F.....New York.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.
American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.
Donnelly Salvage & Wrecking Co.....
.....Kingston, Ont.

TRAPS, STEAM.
Kieley & Mueller .....New York.
Sturtevant Co., B. F., ...Hyde Park, Mass.

TRUCKS.
Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.
Shelby Steel Tube Co.....Pittsburg, Pa.

Buyers' Directory of the Marine Trade.—*Continued.*

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VALVES FOR WATER AND GAS.

Lunkenheimer Co. .....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VARNISHES.

Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H. .....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hall, John B .....Buffalo.
Helm & Co., D. T.....Duluth.

VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel .....New York.
Hutchinson & Co.....Cleveland.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

WATER GAUGES.

Bonner & Co., Wm. T.....Boston
Lunkenheimer Co. .....Cincinnati, O.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

WHISTLES, STEAM.

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.

WINDLASSES.

American Ship Windlass Co..Providence, R. I.
American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Marine Mfg. & Supply Co.....New York.

WINCHES.

American Ship Windlass Co..Providence, R. I.
Georgian Bay Engineering Works..... .....Midland, Ont.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.
Parker Bros. Co., Ltd.....Detroit.

YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd..Toronto, Can.
Drein, Thos. & Son.....Wilmington, Del.
Georgian Bay Engineering Works..... .....Midland, Ont.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co.....Chicago.

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Drein, Thos. & Son.....Wilmington, Del.

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Eastward	Arrive from West	Depart East
No. 18, Southwestern Limited	.....	*1:50 a.m.
No. 22, Lake Shore Limited	*2:12 a.m.	*2:20 a.m.
No. 20, Chicago and Cleveland Exp.	*7:20 a.m.	.....
No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston–New York Express	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl.	.....	*3:00 p.m.
No. 46, Southwestern Express	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....

Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No 9, Day Express	.....	†6:10 a m.
No. 15, Boston and Chicago Special	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	‡11:10 a.m.	.....
No 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp.	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p m.
No. 141, Sandusky Accommodation	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
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No. 3, Fast Mail Limited	*10.50 p.m.	*10:55 p.m.
No 115, Ashtabula Accommodation	*8.30 a.m.	.....

*Daily. †Except Sunday. ‡Except Monday.
Trains Nos. 23, 28 and 37 run via Erie Station.
City Ticket Office, 237 Superior St

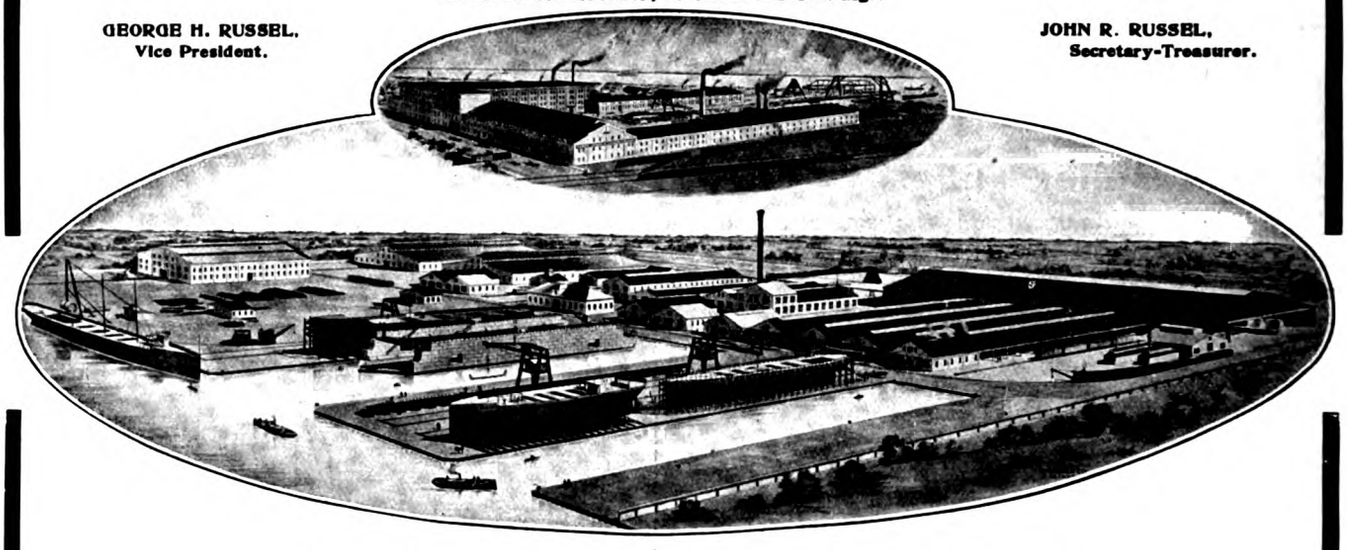
GREAT LAKES ENGINEERING WORKS

DETROIT, MICH.

ANTONIO C. PESSANO, President and Gen. Mgr.

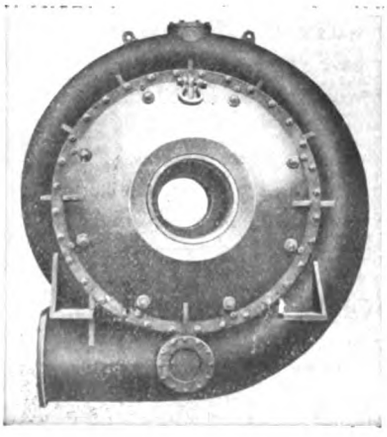
GEORGE H. RUSSEL, Vice President.

JOHN R. RUSSEL, Secretary-Treasurer.



Designers and Builders of Steel Freight and Passenger Ships. Steel Car Ferries. = Marine Engines.

Hydraulic Dredges.



Our Engines and Pumps are in service in every important section of the United States, including the Philippine Islands.